Environmental Engineering, Civil Engineering
Forensic Engineering, Construction Services

MARCH 2015 AIR SAMPLING STATUS REPORT

Former United Shoe Machinery Division North Parcel
181 Elliott Street
Beverly, MA

Prepared for:

Cummings Properties, LLC
200 West Cummings Park
Woburn, MA 01801

Prepared by:

FSL Associates, Inc.
358 Chestnut Hill Avenue
Boston, MA 02135

April 24, 2015

March 2015 Air Sampling Status Report for United Shoe Machinery Division North Parcel, Beverly, Massachusetts
Document Title

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Prepared By

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Address and Telephone Number

April 24, 2015
Date

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Signature

Bruce A. Hoskins
Printed Name/Date

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Signature

Jarod Cournoyer
Printed Name/Date

U.S. EPA Project Manager Approval: _____
Signature

Marilyn St. Fleur
Printed Name/Date

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1.0 SITE BACKGROUND AND HISTORY

1.1 Site Background

The former United Shoe Machinery (USM) Division North Parcel consists of approximately 80 acres at 181 Elliott Street in Beverly, Massachusetts. A Locus Plan is shown as **Figure 1** and a Site Plan as **Figure 2**. The Cummings Center (Former USM Machinery Division North Parcel) constitutes only a portion of the entire property that was the Former USM Machinery Division. The "South Parcel" of the Former USM Machinery Division is located on the south side of Elliott Street (Route 62).

This site has been included in the U.S. EPA's RCRA 2020 Corrective Action Universe list. By the year 2020, EPA and the authorized states plan to have largely completed the work of implementing final remedies at all facilities requiring Corrective Action. This site is listed under the site number MAD 043415991 as USM Machinery Division. Massachusetts has not been given RCRA authorization for this site, therefore EPA is acting as the agency in charge for the RCRA program. As part of the RCRA 2020 program, EPA is overseeing an audit of the prior remedial actions. Despite that the site has undergone significant site assessment and remediation, the site is not listed as Remedy Construction in the RCRA 2020 database.

A Quality Assurance Project Plan (QAPP) and Sampling and Analysis Plan (SAP) dated July 30, 2012 was submitted and approved in 2012. This document included information on the proposed additional indoor air sampling activities to be implemented. Based upon review of the Site history and consideration of the current use of the Site, the primary question to be addressed by this investigation is whether potential volatile contaminant concentrations present a significant risk to the indoor air of the occupied buildings.

The Data Quality Objectives (DQO) for this investigation are designed to characterize the presence of volatile organic compounds in the indoor air in the occupied buildings and to determine if the presence of such compounds represents a significant risk to human health. Specific attention shall be given to the child, which represents the most sensitive receptor. Child day care and/or school uses currently occur in portions of Buildings 100 and 600.

1.2 Site Indoor Air Sampling History

Previous investigations were conducted to assess indoor air quality in the buildings at the site. Such investigations involved the collection of soil gas data collected from soil borings installed underneath or adjacent to building footprints. In December 2004, soil gas probes were installed and soil gas samples were collected from around the exterior walls of Building 600 (see **Figure 2**). In February 2006, additional soil gas probes were installed and soil gas samples were collected from around the exterior walls of Building 600 and underneath the floor slab of Building 500 (see **Figure 2**). Soil gas samples were analyzed using the TO-15 method for

volatile compounds and the Massachusetts Air-Phase Petroleum Hydrocarbon (APH) method. The following compounds were detected during the 2004 and 2006 sampling events:

Acetone	Chloromethane	n-Hexane	Tetrachloroethylene
Benzene	Cyclohexane	2-Hexanone	Tetrahydrofuran
Bromodichloromethane	Dibromochloromethane	Isopropyl Alcohol	Toluene
1,3-Butadiene	1,1-Dichloroethane	Methylene Chloride	1,1,1-Trichloroethane
C_5-C_8 Aliphatics	Ethyl Acetate	Methyl Ethyl Ketone	Trichlorofluoromethane
C_9-C_{12} Aliphatics	Ethyl Alcohol	Methyl t-Butyl Ether	1,2,4-Trimethylbenzene
C_9-C_{10} Aromatics	Ethylbenzene	4-Methyl-2-Pentanone	1,3,5-Trimethylbenzene
Carbon Disulfide	4-Ethyl Toluene	Naphthalene	2,2,4-Trimethylpentane
Chloroform	Heptane	Propylene	Xylenes

Another investigation to address indoor air quality was performed in February 2008, when soil gas probes were installed around the exterior perimeter of Building 100. Soil gas samples were collected and analyzed using the TO-15 method for volatile compounds and the Massachusetts APH method. The following compounds were detected during the 2008 sampling event:

Acetone	1,1-Dichloroethane	n-Hexane	Tetrahydrofuran
C_5-C_8 Aliphatics	1,1-Dichloroethene	Isopropyl Alcohol	Toluene
C_9-C_{12} Aliphatics	Dichlorodifluoromethane	Methylene Chloride	1,1,1-Trichloroethane
Carbon Disulfide	Ethyl Alcohol	Methyl Ethyl Ketone	Trichloroethylene
Chloroethane	Heptane	Tetrachloroethylene	Trichlorofluoromethane
Chloroform			

Separate site-specific risk characterizations were performed using the 2004 and 2006 data for Buildings 500 and 600 and the 2008 data for Building 100. Risk characterizations were performed using the Method 3 protocols under the Massachusetts Contingency Plan. As actual indoor air data had not been collected at that time, applicable risk models were used to predict indoor air concentrations. These risk characterizations all concluded that there was no significant risk to human health (either to the child or adult) as a result of potential indoor air concentrations of volatile compounds based on the soil gas data.

The use of historic data as a baseline is appropriate as the purpose of this additional investigation is to determine if significant risk exists from compounds that may have been present during previous USM facility operations. The use of historic data would allow for the inclusion of degradation compounds of those volatile compounds previously detected as compounds of concern.

2.0 SUMMARY OF SAMPLING AND ANALYSIS PLAN AND PREVIOUS RISK CHARACTERIZATION

This Sampling and Analysis Plan was limited to the collection of air samples to establish conditions related to indoor air quality where children are present on the property for school or day care purposes. There were four locations on the property where such use has been ongoing (see **Figure 3**):

- Bright Horizons Children's Center
  100 Cummings Center, S-149-J

- Futures Behavior Therapy Center
  100 Cummings Center, S-157-J

- New England Academy
  500 Cummings Center, S-1100

- Beverly Children's Learning Center
  600 Cummings Center, S-171-X

Since the last Status Report in July 2014, New England Academy is no longer a tenant at the site.

Samples were collected during both summer and winter seasons to allow for seasonal variation. In addition, during each sampling event, one sample was collected from an exterior location to establish local ambient background conditions. The exterior location for samples collected from 2012-2014 was the roof of the North Parking Deck (250 Cummings Center). The locations of the above-described locations are shown in **Figure 3**.

During each sampling event, a Summa canister was placed at each of the five previously designated sampling locations. At one of the indoor sampling locations, a second canister was placed in order to collect a duplicate sample. The sample collection duration was approximately twenty-four hours.

Samples were analyzed for the following parameters:

- Air-Phase Petroleum Hydrocarbons (APH)
- Volatile Organic Compounds (VOCs) using EPA Method TO-15

Where feasible, sample analysis was performed in the SIM mode to obtain the lowest achievable (i.e., most conservative) detection limits.

The first round of sampling was initiated on September 20, 2012 and concluded on September 21, 2012. A second round of sampling was initiated on February 4, 2013 and concluded on February 5, 2013. A third round of sampling was initiated on February 7, 2014 and concluded on February 8, 2014. Care was taken during the second round to place the canisters as close as

possible to the exact locations of previous canister placement during the September 2012 sampling event.

On May 24, 2013, a report titled “Indoor Air Sampling Analysis and Risk Characterization Report" was submitted to EPA. This report included the results of the sampling efforts in 2012 and 2013 and included a risk characterization of the indoor air data results to determine if a potential significant risk to human health was present from the indoor air pathway. The results were mostly consistent regardless of whether EPA or MassDEP risk factors were utilized. For excess lifetime cancer risk, there appeared to be no significant risk in any of the sampling locations. Moreover, no significant cancer risk was calculated at any of the sampling locations using detected compounds. Only in the scenario where *undetected* compounds were included in the evaluation and background levels were excluded was a significant cancer risk calculated (using EPA cancer slope factors). Under that scenario, the majority of the cancer risk was from three *undetected* compounds (1,2-dibromomethane, benzyl chloride, and vinyl bromide), and even the outdoor background sample had a calculated significant cancer risk. Overall, no excess cancer risk existed or exists in any of the sampling locations, regardless of whether the source of the detected contaminants is related to vapor intrusion, interior sources, exterior background air, or a combination of any of these.

For the non-carcinogenic hazard index, the risk characterization results across the various calculated scenarios were even more consistent regardless of whether EPA or MassDEP risk factors were utilized, undetected compounds were included in the risk calculations, or exterior background was considered. Under all evaluated scenarios, there was no elevated hazard index for Suite 149-J in Building 100, Suite 1000 in Building 500, Suite 171-X in Building 600, or in the exterior background sample. There was an elevated hazard index for Suite 157-J in Building 100 for all evaluated scenarios. Nearly all of the cumulative hazard index in Suite 157-J resulted from the concentrations of 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene (for the EPA risk calculation) and the concentrations of all three petroleum hydrocarbon fractions in the APH analysis (for the MassDEP risk calculation). 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene are compounds typically found in petroleum hydrocarbons; MassDEP does not quantify them individually for risk purposes since their presence in already included with the risk of the APH.

When evaluating the data in Suite 157-J from September 2012 and February 2013, elevated concentrations of APH and trimethylbenzenes were detected in both sampling events. The conclusion from this assessment was that airborne petroleum hydrocarbons were present in Suite 157-J that could be considered to be potential significant risk concern, based on the calculation methodology used for this assessment. Given that the exterior background samples had little to no detection of APH or trimethylbenzenes, the source of the petroleum hydrocarbons was not suspected to be coming from the outside. Remaining potential sources of the petroleum hydrocarbons thus included interior source(s) within the suite space and vapor intrusion from the previous USM operations.

No further actions were recommended in Suite 149-J in Building 100, Suite 1000 in Building 500, or Suite 171-X in Building 600. Additional air sampling was recommended to evaluate the concentrations of petroleum hydrocarbons in Suite 157-J.

Additional air sampling was performed from February 7-8, 2014. The previous sampling plan was revised to include three separate sampling locations within the space (see **Figure 4**). These sampling locations included:

- Administrative Office (noted as sample S-157-J). This is the same location used in the previous sampling efforts in 2012 and 2013.
- Activity room in central part of space (noted as sample S-157-J.1).
- Activity room near eastern building exit (noted as sample S-157-J.2).

A total of five field samples (not including duplicates) have been collected from 2012-2014 and the overall results show a relatively consistent indication of the indoor air quality in the space regardless of sample location or time of year collected. A total of 35 compounds have been detected in at least one sample in Suite 157-J; 24 of those compounds have been detected in all five samples. An additional four compounds have been detected in at least four of the samples. For the compounds detected consistently, there has been little variation in the detected concentrations.

Due to the consistent nature of the data and the continued presence of petroleum-related compounds that may result in a significant risk to human health, additional sampling (soil gas) was collected in conjunction with the Winter 2015 indoor air samples to determine if the presence of such compounds is a result of vapor intrusion. Samples were collected from a total of four soil gas point locations. These locations are shown in **Figure 5**. At each location, a permanent soil gas point was installed in accordance with MassDEP protocols. From each point, a single grab sample was collected (see Section 3.0).

3.0 MARCH 2015 SAMPLE COLLECTION

3.1 Soil Gas Point Installation

A total of four (4) sub-slab soil gas sample points were installed in Suite 157-J in Building 100 by Eastern Analytical, Inc. (EAI) of Concord, NH under supervision by FSL Associates, Inc, of Boston, MA (FSL) on February 25, 2015. The locations of the points are shown in **Figure 5**. Points were installed using the procedures outlined in the FSL Standard Operating Procedure for Sub-Slab Soil Gas Sampling. This Standard Operating Procedure is attached as **Appendix A**. The thickness of the concrete slab at soil gas sample points SG-2, SG-3, and SG-4 was approximately 1.0 feet. Two (2) attempts were made to install sample point SG-1 in the southwestern closet (see **Figure 5**); the depth of concrete at each of these two (2) attempts was at least 1.5 feet. This was roughly the length of the drill being used by EAI to install the points; therefore, FSL chose to install sample point SG-1 in the northwest corner of the hallway adjacent to the closet. The thickness of the concrete at sample point SG-1 was approximately 1.0 feet. Photos related to point installations are included in **Appendix B**. Field log book notes are included in **Appendix C**.

While advancing the drill during installation of sample point SG-1 in the hallway, EAI personnel noticed a petroleum odor emanating from the soil that was below the concrete slab. FSL personnel proceeded to collect a sample of the soil in driller jars provided to FSL by EAI. The soil sample was relinquished to RI Analytical, Inc. of Warwick, RI under chain of custody to be analyzed for Extractable Petroleum Hydrocarbons (EPH) with polycyclic aromatic hydrocarbons (PAHs) according to MassDEP EPH methodology. There was not enough soil available to also conduct analysis for volatile petroleum hydrocarbons. The analysis results had detected concentrations of two of the three EPH hydrocarbon fractions. C_9-C_{18} Aliphatics were detected at 92 mg/kg and C_{19}-C_{36} Aliphatics were detected at 110 mg/kg; these values are less than 10% of MassDEP reportable levels. There were no detections of PAHs or the C_{11}-C_{22} Aromatic hydrocarbon fraction. The full analytical report is included in **Appendix D**.

3.2 Soil Gas Sample Collection

For each of the soil gas points installed (see **Figure 5**), a single air sample was collected. Samples were collected by FSL using a 2.7-liter canister for the purposes of collecting a 30-minute composite. Canisters and regulators were provided by Alpha Analytical of Mansfield, MA. One canister was placed in each of the sampling locations as described above. A field blank canister was also included with the sampling event. Soil gas sampling was performed on March 6, 2015. Details on the sampling canisters are provided in the table below:

Sample Location	Sampling Start Time and Date	Sampling Stop Time and Date	Canister ID	Regulator ID	Regulator Start Pressure (inches Hg)	Regulator Stop Pressure (inches Hg)
SG-1	7:12 PM 3/6/15	7:43 PM 3/6/15	259	0309	-29.94	0.00
SG-2	6:21 PM 3/6/15	6:51 PM 3/6/15	1748	0342	-30.01	-0.44
SG-3	7:01 PM 3/6/15	7:31 PM 3/6/15	383	0389	-28.96	0.00
SG-4	7:32 PM 3/6/15	8:02 PM 3/6/15	2015	0259	-30.25	-1.40

Photos related to sampling are included in **Appendix B**. Field log book notes are included in **Appendix C**.

The canisters were received by Alpha Analytical on March 10, 2015 under a chain of custody. Samples were requested for analysis for the following parameters:

- Air-Phase Petroleum Hydrocarbons (APH)
- Volatile Organic Compounds (VOCs) using EPA Method TO-15

Sample analysis was requested to be performed in the SIM mode to obtain the lowest achievable (most conservative) detection limits. In accordance with the APH analytical method, the potential identification of non-APH compounds (such as chlorinated solvents, ketones, and ethers) may represent an interference with the quantitative response within the aliphatic or aromatic hydrocarbon range. A specific request was made for non-APH compounds to be identified in the laboratory report form or narrative, such that the data may be evaluated for such potential interference.

3.3 Indoor Air Sample Collection

The March 2015 sample collection occurred in Suite 157-J in Building 100 and at an exterior collection location. The outdoor location was relocated at the request of EPA to a non-elevated location (not on a building roof). The outdoor location (Sample ID "Outdoor Control") was inside the fenced outdoor play area for the Bright Horizons daycare in Building 100 (see **Figure 3** and photo in **Appendix B**). The outdoor play area had been covered with snow, so a portion of the snow was removed to allow access and sample collection. The March 2015 sampling used the same indoor locations as the February 2014 sampling (see **Figure 4**). These sampling locations included:

- Administrative Office (noted as sample S-157-J).
- Activity room in central part of space (noted as sample S-157-J.1).
- Activity room near eastern building exit (noted as sample S-157-J.2).

Samples were collected by FSL Associates, Inc, of Boston, MA using a six-liter canister for the purposes of collecting a 24-hour composite. Canisters and regulators were provided by Alpha Analytical of Mansfield, MA. One canister was placed in each of the sampling locations as described above. In addition, a second canister was placed in the sampling location at S-157-J; this second canister represented a field duplicate. Each canister was placed on a metal chair such that each canister base was elevated approximately two feet from the floor (or exterior ground) surface. A field blank canister was also included with the sampling event. Sampling was initiated on March 6, 2015 and concluded on March 8, 2015. Details on the sampling canisters are provided in the table below:

Sample Location	Sampling Start Time and Date	Sampling Stop Time and Date	Canister ID	Regulator ID	Regulator Start Pressure (inches Hg)	Regulator Stop Pressure (inches Hg)
Outdoor Control	6:40 PM 3/6/15	1:31 PM 3/8/15	1889	0102	-30.32	-0.52
S-157-J	6:34 PM 3/6/15	1:24 PM 3/8/15	1598	0354	-26.05	0.00
Duplicate (of S-157-J)	6:33 PM 3/6/15	1:24 PM 3/8/15	1794	0243	-30.37	0.00
S-157-J.1	6:31 PM 3/6/15	1:25 PM 3/8/15	1662	0114	-30.55	0.00
S-157-J.2	6:26 PM 3/6/15	1:22 PM 3/8/15	985	0285	-30.70	0.00

The canisters were received by Alpha Analytical on March 10, 2015 under a chain of custody. Samples were requested for analysis for the following parameters:

- Air-Phase Petroleum Hydrocarbons (APH)
- Volatile Organic Compounds (VOCs) using EPA Method TO-15

Sample analysis was requested to be performed in the SIM mode to obtain the lowest achievable (most conservative) detection limits. In accordance with the APH analytical method, the potential identification of non-APH compounds (such as chlorinated solvents, ketones, and ethers) may represent an interference with the quantitative response within the aliphatic or aromatic hydrocarbon range. A specific request was made for non-APH compounds to be

identified in the laboratory report form or narrative, such that the data may be evaluated for such potential interference.

3.4 **Meteorological Data During Sample Collection**

The following weather conditions were observed from the weather station at the Beverly Municipal Airport during the days of sample collection:

Date	**Mean Temperature (ºF)**	**Mean Sea Level Pressure (Inches)**	**Mean Wind Speed (Miles Per Hour)**	**Precipitation (Inches)**
3/6/2015	14	30.40	9	0.00
3/7/2015	24	30.08	8	0.00

4.0 SUMMARY OF AIR SAMPLING RESULTS

A summary of the air sampling results for samples collected in March 2015 is provided in **Tables 1** and **2**. The full analytical report is presented in **Appendix D**.

For the purposes of initial data evaluation, the results were compared to the EPA Target Risk values (carcinogenic = 1E-06 or Hazard Index = 0.1; updated November 2014) and the MassDEP Residential Threshold Values (updated October 2014). Exceedance of these values does not mean a significant risk to human health is present; a detailed site-specific risk evaluation was completed after the winter 2013 sampling event. This was documented in a report titled “Indoor Air Sampling Analysis and Risk Characterization Report" dated May 24, 2013. The conclusions of the risk characterization indicated a potential significant human health risk in the Suite 157-J space due to petroleum related compounds.

A total of 69 compounds (or groups of compounds) were included on the sample analysis list. 65 compounds were related to the VOC analysis using the EPA TO-15 method and 11 compounds were included for APH analysis. A total of seven compounds (1,3-butadiene, benzene, ethylbenzene, methyl-tert-butyl ether, toluene, m- & p-xylenes, and o-xylenes) were included in the analysis list for both methods.

A limited data validation was performed on the sample analysis in conformance with the QAPP. In summary, the data appear to be valid as reported and may be used for decision-making purposes. The Data Validation Memo is included as **Appendix E**.

36 different compounds were detected in one of more of the indoor air samples. Of specific note, although a total of seven compounds (1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, benzene, carbon tetrachloride, chloroform, isopropyl alcohol, and naphthalene) were detected in one or more indoor air samples at levels that exceeded the EPA target risk values, no values were greater than ten times the EPA target risk values (carcinogenic risk >1E-05 or hazard index >10). Three of these compounds (1,2,4-trimethylbenzene, benzene, and carbon tetrachloride) were detected in all samples, including the outdoor background sample. Two of these four compounds (benzene and carbon tetrachloride) were detected in all samples (including the outdoor background sample) at levels that exceeded the EPA target risk value. The APH analysis detected two petroleum hydrocarbon fractions in all indoor air samples above the MassDEP target risk values, but these fractions were not detected in the outdoor background samples.

In addition, there were five compounds from the indoor air VOC analyte list (1,1,2,2-tetrachloroethane, 1,2-dibromoethane, benzyl chloride, hexachlorobutadiene, and vinyl bromide) where the method detection limit exceeded the EPA target risk value. This is an improvement over previous sampling when 10 compounds had detection limits that exceeded the EPA target risk values. However, it should be noted that none of these five compounds was detected in soil gas samples. Therefore, since their presence in soil gas could only be at levels below analytical detection limits, their potential presence in indoor air due to vapor intrusion would be at least an

order of magnitude below the analytical detection limits; in which case those values would be below the EPA target risk values.

40 different compounds were detected in one of more of the soil gas samples. However, there were no exceedances of the MassDEP residential screening values for soil gas.

A comparison of all indoor air samples collected in Suite 157-J between 2012 and 2015 is shown in **Table 3**. A total of eight samples (not including duplicates) have been collected during that time period and the overall results show a relatively consistent indication of the indoor air quality in the space regardless of sample location or time of year collected. A total of 38 compounds have been detected in at least one sample in Suite 157-J; 24 of those compounds have been detected in all eight samples. An additional five compounds have been detected in at least six of the eight samples. For the compounds detected consistently, there has been little variation in the detected concentrations.

A direct comparison was made between the 2015 indoor air and soil gas sample analysis results to assess whether vapor intrusion is potentially occurring within the building space. Of the 40 different compounds detected in soil gas, 33 of those compounds were also detected in indoor air. Compounds detected in soil gas but not in indoor air included 1,1,1-trichloroethane, 1,2,4-trichlorobenzene, 1,2 dichlorobenzene, 1,4-dichlorobenzene, carbon disulfide, trans-1,2-dichloroethene, and vinyl chloride. Compounds detected in indoor air but not detected in soil gas included 1,2-dichloroethane, 1,3-butadiene, and methylene chloride. 33 compounds were detected in both indoor air and soil gas; in 21 of them the concentrations in indoor air either were equivalent to or exceeded the concentrations in soil gas. Of specific note, six of these 21 compounds (1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, benzene, carbon tetrachloride, chloroform, and isopropyl alcohol) were detected in one or more indoor air samples at levels that exceeded the EPA target risk values. Significant vapor intrusion is not occurring when the indoor air contaminant concentrations are equivalent to or exceed the concentrations in soil gas.

The only compounds detected in soil gas at concentrations suggesting possible vapor intrusion (where a potential significant risk concern is present due to the levels in the indoor air samples) are naphthalene and the APH petroleum hydrocarbon fractions. However, even with these compounds, the soil gas results are inconsistent as the only potentially elevated compounds detected (elevated in comparison to indoor air results) were naphthalene, C_9-C_{12} Aliphatics, and C_9-C_{10} Aromatics in sample SG-1 and C_5-C_8 Aliphatics and C_9-C_{12} Aliphatics in sample SG-4. And, even these highest concentrations detected in soil gas are below MassDEP's residential screening levels; according to MassDEP guidance, these levels would likely not result in significant vapor intrusion.

5.0 CORRECTIVE ACTIONS

No corrective measures were necessary in regard to the field collection of samples, and no corrective measures were required during the laboratory analysis.

6.0 CONTINUED ACTIONS

The next sampling event is scheduled for the summer of 2015 and is intended to take place in July-August of 2015. The exact schedule will be determined after this report has been submitted to EPA, who will be provided, as requested, with one week's advance notice of the sampling event.

The scope of work performed for the March 2015 sampling will be repeated in its entirety. Both indoor air and soil gas samples will be collected within the same time proximity.
Sample analysis will consist of the following parameters:

- Air-Phase Petroleum Hydrocarbons (APH)
- Volatile Organic Compounds (VOCs) using EPA Method TO-15

Sample analysis will be requested to be performed in the SIM mode to obtain the lowest achievable (most conservative) detection limits. In accordance with the APH analytical method, the potential identification of non-APH compounds (such as chlorinated solvents, ketones, and ethers) may represent an interference with the quantitative response within the aliphatic or aromatic hydrocarbon range. A specific request will be made for non-APH compounds to be identified in the laboratory report form or narrative, such that the data may be evaluated for such potential interference.

Data from the March 2015 sampling event suggest that significant vapor intrusion is not occurring even for compounds where a potential significant risk may be present. The summer 2015 sampling event will provide additional information to support or refute this suggested conclusion. After the conclusion of the summer 2015 sampling, the Indoor Air Sampling Analysis and Risk Characterization Report previously submitted in May 2013 will be revised and updated to include information collected since May 2013 and to address comments made by EPA.

Figures

SITE COORDINATES
Longitude: -70.8871 W
Lattitude: 42.5596 N
UTM 4,713,634m N
345,086m E

Approximate Scale: 1 inch = 2,000 feet (1:24,000)

Figure 1 - Locus Plan

Former United Shoe Machinery North Parcel
181 Elliott Street
Beverly, MA

Project Number: 12201
Client: Cummings

Created By: EAF Date: 03/15/12
Checked By: BH Date: 03/15/12

Reference: MassGIS USGS Quadrangle: SALEM and MARBLEHEAD NORTH
Image: M/12201_Beverly/2012/Figures

Figure 2 - Site Plan

Former United Shoe
Machinery North Parcel
181 Elliott Street
Beverly, MA

LEGEND

Site Bound

N E S W

0 150 300 600
Feet

Approximate Scale: 1 inch = 300 feet

GEOSPHERE
ENVIRONMENTAL MANAGEMENT INC.
51 Portsmouth Ave. - Exeter, NH 03833 - (603) 773-0075

Project Number: 12201
Client: Cummings

Created By: EAF Date: 03/15/12
Checked By: BAH Date: 03/15/12

Reference: MassGIS 2008 15CM Orthophotos
Image: M/12201_Beverly/2012/Figures

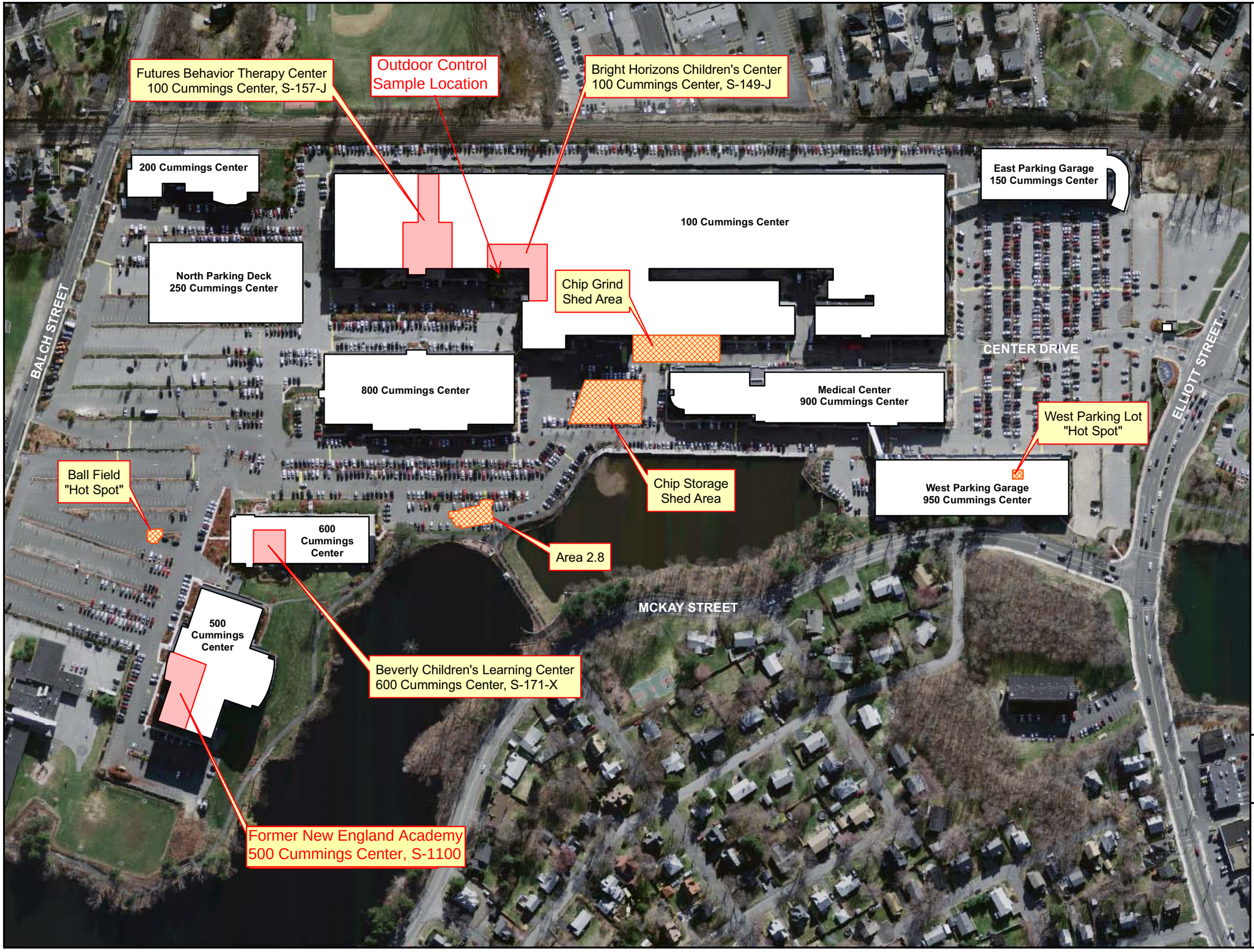


Figure 3
Building Areas Used As Child Day Care Centers Or Schools

Former United Shoe Machinery North Parcel
181 Elliott Street
Beverly, MA

LEGEND

- DAY CARE OR SCHOOL
- SOIL REMEDIATION AREA
- BUILDING

N E S W

0 100 200 400 Feet

Approximate Scale: 1 inch = 200 feet

GEOSPHERE
ENVIRONMENTAL MANAGEMENT INC.
51 Portsmouth Ave. - Exeter, NH 03833 - (603) 773-0075

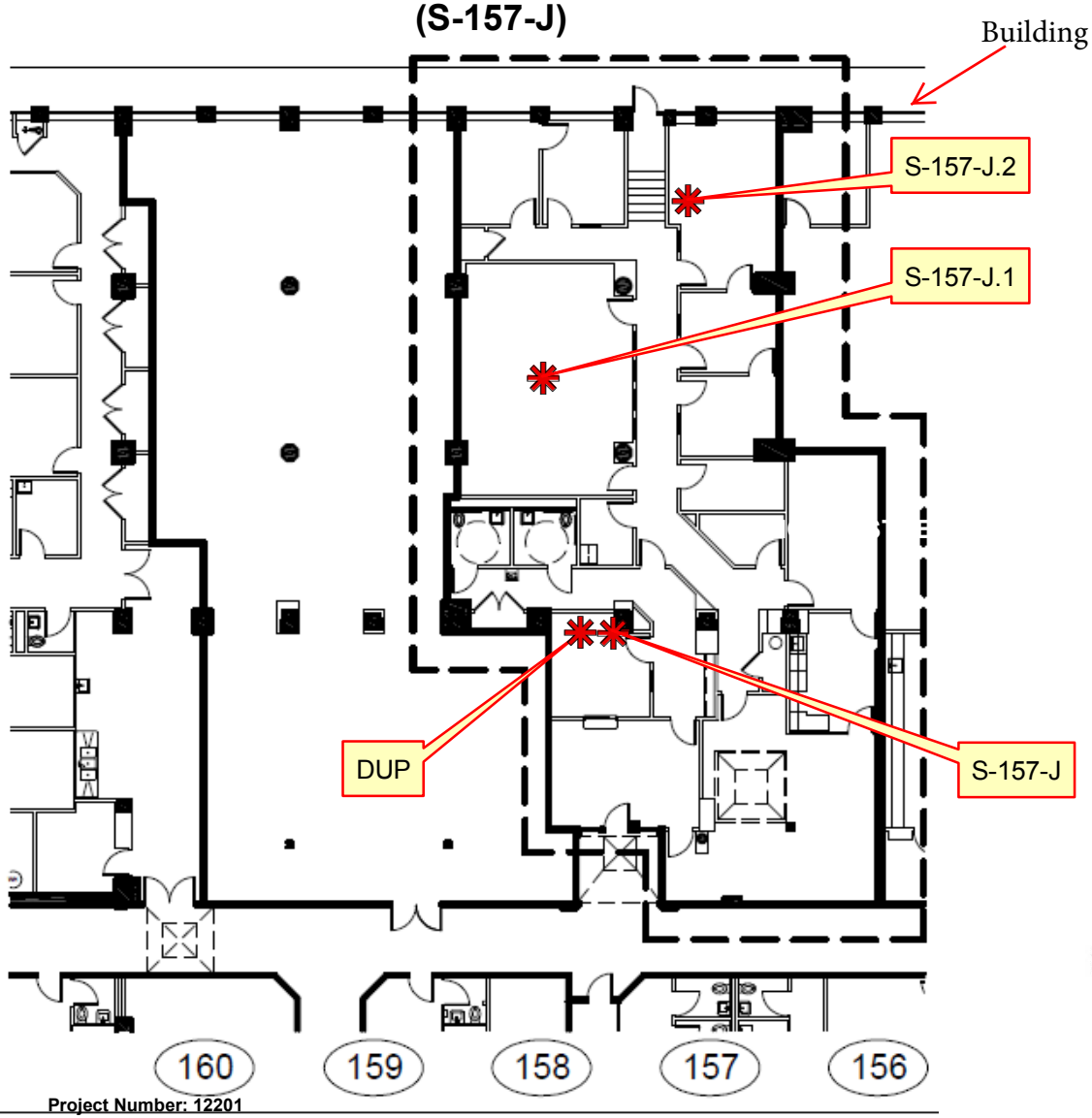
Project Number: 12201
Client: Cummings

Created By: EAF Date: 03/15/12
Modified By: AF Date: 04/15/13
Checked By: BAH Date: 04/15/13

Reference: MassGIS 2008 15CM Orthophotos
Image: M/12201_Beverly/2013/Figures

Figure 4
Indoor Air Sampling Locations

Futures Behavior Therapy Center
100 Cummings Center
(S-157-J)



Project Number: 12201
Client: Cummings
Created By: EF Date: 05/22/14
Checked By: DN Date: 05/22/14

0 5' 10' 20' 40'

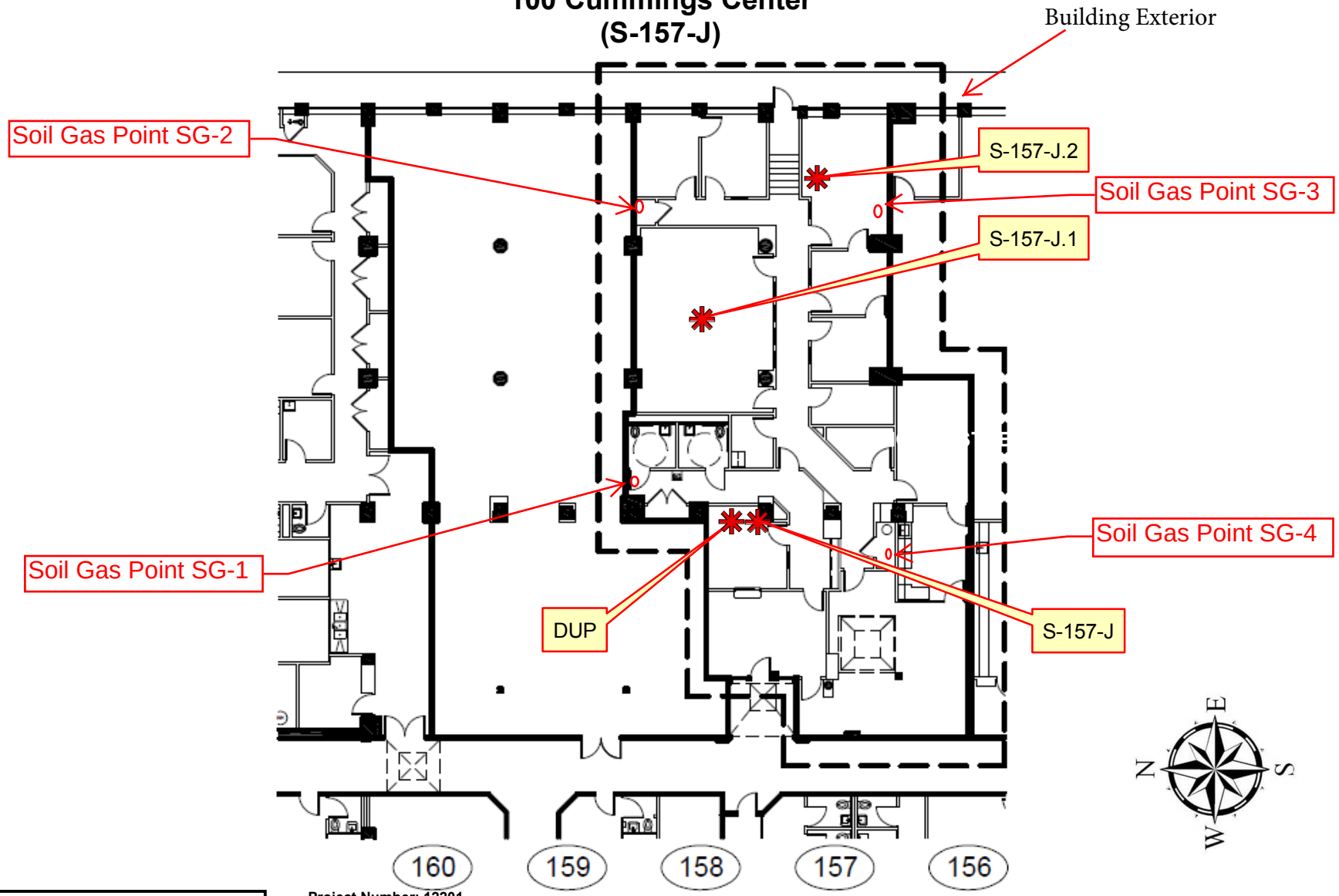
-All dimensions are appro
-CPL standard constructi

GEOSPHERE
ENVIRONMENTAL MANAGEMENT INC.
51 Portsmouth Ave. - Exeter, NH 03833 - (603) 773-0075

Reference:
Cummings Properties,
Engineering Plans, 05/27/2009

Figure 5
Soil Gas and Indoor Air Sampling Locations

Futures Behavior Therapy Center
100 Cummings Center
(S-157-J)



GEOSPHERE ENVIRONMENTAL MANAGEMENT INC.
51 Portsmouth Ave. - Exeter, NH 03833 - (603) 773-0075

Project Number: 12201
Client: Cummings
Created By: EF Date: 05/22/14
Checked By: DN Date: 05/22/14

0 5' 10' 20' 40'

-All dimensions are appro...
-CPL standard constructi...

Reference:
Cummings Properties,
Engineering Plans, 05/27/2009

Tables

TABLE 1

Indoor Air Chemical Analysis Results
Cummings Center, Beverly, MA
March 2015

Sample ID	S-157-J	S-157-J (Duplicate)	S-157-J.1	S-157-J.2	Outdoor Control		
Sample Location	Building 100 Interior, Suite 157-J	Building 100 Interior, Suite 157-J	Building 100 Interior, Suite 157-J	Building 100 Interior, Suite 157-J	Building 100 Bright Horizons Outdoor Playground		
Sample Type	Air	Air	Air	Air	Air	EPA Target Risk: Carcinogenic =	MassDEP Residential Threshold
Date Sampled	3/6/2015 to 3/8/2015	3/6/2015 to 3/8/2015	3/6/2015 to 3/8/2015	3/6/2015 to 3/8/2015	3/6/2015 to 3/8/2015	1E-06 or HI = 0.1	Values
Volatile Organic Compounds (µg/m3)							
1,1,1-trichloroethane	<0.038	<0.038	<0.038	<0.038	<0.038	520 (HI)	3
1,1,1,2-tetrachloroethane	<0.028	<0.028	<0.028	<0.028	<0.028	0.38	
1,1,2,2-tetrachloroethane	<0.048	<0.048	<0.048	<0.048	<0.048	0.042	0.04
1,1,2-trichloroethane	<0.049	<0.049	<0.049	<0.049	<0.049	0.18	0.15
1,1-dichloroethane	<0.028	<0.028	<0.028	**0.077J**	<0.028	1.8	0.8
1,1-dichloroethene	<0.028	<0.028	<0.028	<0.028	<0.028	21 (HI)	0.8
1,2,4-trichlorobenzene	<0.074	<0.074	<0.074	<0.074	<0.074	0.21 (HI)	0.4
1,2,4-trimethylbenzene	**15.1**	**17**	**15.1**	**14.6**	**0.084J**	0.73 (HI)	
1,2-dibromoethane	<0.062	<0.062	<0.062	<0.062	<0.062	0.0047	
1,2-dichlorobenzene	<0.042	<0.042	<0.042	<0.042	<0.042	21 (HI)	0.72
1,2-dichloroethane	**0.077J**	**0.077J**	**0.065J**	<0.032	**0.061J**	0.11	0.09
1,2-dichloropropane	<0.028	<0.028	<0.028	<0.028	<0.028	0.28	0.12
1,3,5-trimethylbenzene	**4.04**	**4.46**	**3.74**	**3.95**	<0.025	0.73 (HI)	
1,3-butadiene	**0.058**	**0.066**	**0.064**	**0.071**	**0.038**	0.094	
1,3-dichlorobenzene	<0.042	<0.042	<0.042	<0.042	<0.042	21(HI)	0.6
1,4-dichlorobenzene	<0.048	<0.048	<0.048	<0.048	<0.048	0.26	0.5
1,4-dioxane	<0.281	<0.281	<0.281	<0.281	<0.281	0.56	0.57
2,2,4-trimethylpentane	<0.308	<0.308	<0.308	<0.308	<0.308	N/A	
2-butanone	**1.57**	**1.18J**	**1.12J**	**1.24J**	**0.434J**	520(HI)	12
2-hexanone	<0.248	<0.248	<0.248	<0.248	<0.248	3.1(HI)	
3-chloropropene	<0.254	<0.254	<0.254	<0.254	<0.254	0.47	
4-Ethyltoluene	**3.66**	**3.95**	**3.75**	**3.49**	<0.381	N/A	
Acetone	**33**	**31.4**	**25.2**	**28.0**	**5.56**	3,200(HI)	91
Benzene	**0.827**	**0.767**	**0.815**	**0.898**	**0.703**	0.36	2.3
Benzyl Chloride	<0.334	<0.334	<0.334	<0.334	<0.334	0.057	
Bromodichloromethane	<0.054	<0.054	<0.054	<0.054	<0.054	0.076	0.13
Bromoform	<0.155	<0.155	<0.155	<0.155	<0.155	2.6	2.1
Bromomethane	<0.031	<0.031	<0.031	<0.031	<0.031	0.52(HI)	0.6
Carbon disulfide	<0.107	<0.107	<0.107	<0.107	<0.107	73 (HI)	
Carbon tetrachloride	**0.434**	**0.409**	**0.434**	**0.44**	**0.434**	0.47	0.54
Chlorobenzene	<0.037	<0.037	<0.037	<0.037	<0.037	5.2 (HI)	2.3
Chloroethane	<0.019	**0.032J**	<0.019	<0.019	<0.019	1,000 (HI)	
Chloroform	**0.117**	**0.122**	**0.103**	**0.107**	**0.073J**	0.12	1.9
Chloromethane	**1.1**	**1.13**	**1.07**	**1.12**	**1.09**	9.4 (HI)	
Cis-1,2-dichloroethene	**0.107**	**0.131**	**0.103**	**0.107**	<0.026	N/A	0.8
Cis-1,3-dichloropropene	<0.036	<0.036	<0.036	<0.036	<0.036	0.7	0.58
Cyclohexane	**25**	**0.334J**	**0.826**	**0.379J**	<0.226	630 (HI)	
Dibromochloromethane	<0.068	<0.068	<0.068	<0.068	<0.068	0.1	0.097
Dichlorodifluoromethane	**1.75**	**1.98**	**1.62**	**1.84**	**1.9**	10 (HI)	
Ethanol	**102**	**84.4**	**70.1**	**72.9**	**5.58**	N/A	
Ethyl acetate	<0.472	<0.472	<0.472	<0.472	<0.472	N/A	
Ethylbenzene	**0.495**	**0.482**	**0.456**	**0.439**	**0.122**	1.1	7.4
Freon-113	**0.621**	**0.583**	**0.506**	**0.529**	**0.529**	3,100 (HI)	
Freon-114	**0.098J**	**0.105J**	**0.091J**	**0.098J**	**0.098J**	N/A	
Hexachlorobutadiene	<0.117	<0.117	<0.117	<0.117	<0.117	0.13	0.11
Hexane	**0.856**	**0.314J**	**0.458J**	**0.483J**	**0.250J**	73 (HI)	
Isopropyl alcohol	**78.4**	**91.7**	**75.2**	**82.1**	<0.280	21 (HI)	
Methylene chloride	**16.2**	**2.72**	**2.08**	**2.16**	<0.869	63 (HI)	11
MIBK	<0.249	<0.249	<0.249	<0.249	<0.249	310 (HI)	2.2
MTBE	<0.014	<0.014	<0.014	<0.014	<0.014	11	39
M+p-xylene	**1.53**	**1.45**	**1.37**	**1.34**	**0.313**	10 (HI)	20
n-heptane	**0.459J**	**0.402J**	**0.451J**	**0.602J**	<0.227	N/A	
Naphthalene	**0.173J**	**0.189J**	**0.184J**	**0.178J**	<0.063	0.083	0.6
o-xylene	**0.786**	**0.808**	**0.751**	**0.721**	**0.117**	10 (HI)	20
Propylene	**0.503J**	**0.520J**	**0.401J**	**0.534J**	**0.492J**	310 (HI)	
Styrene	**0.17**	**0.149**	**0.132**	**0.128**	<0.034	100 (HI)	1.4
Tetrachloroethylene	**0.19**	**0.17**	**0.136**	**0.156**	**0.081J**	4.2 (HI)	1.4
Tetrahydrofuran	<0.183	<0.183	<0.183	<0.183	<0.183	210 (HI)	
Toluene	**3.18**	**3.13**	**2.25**	**2.29**	**0.682**	520 (HI)	54
Trans-1,2-dichloroethene	<0.024	<0.024	<0.024	<0.024	<0.024	N/A	0.8
Trans-1,3-dichloropropene	<0.036	<0.036	<0.036	<0.036	<0.036	0.7	0.58
Trichloroethene	<0.038	<0.038	**0.070J**	**0.107**	<0.038	0.48	0.4
Trichlorofluoromethane	**1.2**	**1.25**	**1.16**	**1.2**	**1.19**	73 (HI)	
Vinyl acetate	<0.200	<0.200	<0.200	<0.200	<0.200	21 (HI)	
Vinyl bromide	<0.306	<0.306	<0.306	<0.306	<0.306	0.088	
Vinyl chloride	<0.018	<0.018	<0.018	<0.018	<0.018	0.17	0.27

TABLE 1

Indoor Air Chemical Analysis Results
Cummings Center, Beverly, MA
March 2015

Sample ID	S-157-J	S-157-J (Duplicate)	S-157-J.1	S-157-J.2	Outdoor Control		
Sample Location	Building 100 Interior, Suite 157-J	Building 100 Interior, Suite 157-J	Building 100 Interior, Suite 157-J	Building 100 Interior, Suite 157-J	Building 100 Bright Horizons Outdoor Playground	EPA Target Risk: Carcinogenic = 1E-06 or HI = 0.1	MassDEP Residential Threshold Values
Sample Type	Air	Air	Air	Air	Air		
Date Sampled	3/6/2015 to 3/8/2015	3/6/2015 to 3/8/2015	3/6/2015 to 3/8/2015	3/6/2015 to 3/8/2015	3/6/2015 to 3/8/2015		
Volatile Organic Compounds (µg/m3)							
Air-Phase Petroleum Hydrocarbon Target Analytes - APH (µg/m3)							
1,3-Butadiene	<2.0	<2.0	<2.0	<2.0	<2.0	0.094	
Methyl-tert-butyl ether	<2.0	<2.0	<2.0	<2.0	<2.0	11	39
Benzene	<2.0	<2.0	<2.0	<2.0	<2.0	0.36	2.3
Toluene	**3.2**	**3.3**	**2.2**	**2.5**	<2.0	520 (HI)	54
Ethylbenzene	<2.0	<2.0	<2.0	<2.0	<2.0	0.97	7.4
m- & p- Xylenes	<4.0	<4.0	<4.0	<4.0	<4.0	10 (HI)	20
o-Xylenes	<2.0	<2.0	<2.0	<2.0	<2.0	10 (HI)	20
Naphthalene	<2.0	<2.0	<2.0	<2.0	<2.0	0.083	0.6
Air-Phase Petroleum Hydrocarbons - APH (µg/m3)							
C_5-C_8 Aliphatic Hydrocarbons	**38**	<12	<12	**14**	<12	N/A	58
C_9-C_{12} Aliphatic Hydrocarbons	**130**	**140**	**120**	**110**	<14	N/A	68
C_9-C_{10} Aromatic Hydrocarbons	**45**	**51**	**46**	**43**	<10	N/A	10

Notes:
Samples collected by FSL Associates, Inc.
Samples submitted to Alpha Analytical of Mansfield, MA
Results presented in µg/m3
NA - Not Analyzed
J - estimated concentration quantified below reporting limit
BOLD = Detected above laboratory standards
gray shaded = detected above applicable standard
blue shaded = analytical detection limit above applicable standard
< = not detected above laboratory detection limit shown
EPA Target Risk Levels are from Regional Screening Level Resident Ambient Air Supporting Table, November 2014. Values preceding "(HI)" indicate compounds that are not considered to be carcinogenic and risk levels are based on noncarcinogenic risk. "N/A" indicates compounds with no risk information available from this source.
MassDEP Residential Threshold Values are from Public Draft Review Vapor Intrusion Guidance, MassDEP Policy WSC# 14-435, October 2014.

TABLE 2

Soil Gas Chemical Analysis Results
Cummings Center, Beverly, MA
March 2015

Sample ID	SG-1	SG-2	SG-3	SG-4	
Sample Location	Building 100 Interior, Suite 157-J	Building 100 Interior, Suite 157-J	Building 100 Interior, Suite 157-J	Building 100 Interior, Suite 157-J	
Sample Type	Soil Gas	Soil Gas	Soil Gas	Soil Gas	MassDEP Residential Sub-Slab
Date Sampled	3/6/2015	3/6/2015	3/6/2015	3/6/2015	Soil Gas Screening Values
Volatile Organic Compounds (µg/m3)					
1,1,1-trichloroethane	**0.136**	**0.044J**	**0.055J**	<0.038	210
1,1,1,2-tetrachloroethane	<0.028	<0.028	<0.028	<0.028	
1,1,2,2-tetrachloroethane	<0.048	<0.048	<0.048	<0.048	2.8
1,1,2-trichloroethane	<0.049	<0.049	<0.049	<0.049	10
1,1-dichloroethane	**0.028J**	<0.028	<0.028	**0.429**	56
1,1-dichloroethene	<0.028	<0.028	<0.028	**0.028J**	56
1,2,4-trichlorobenzene	**0.104J**	<0.074	<0.074	<0.074	28
1,2,4-trimethylbenzene	**17.6**	**0.757**	**0.334**	**0.836**	
1,2-dibromoethane	<0.062	<0.062	<0.062	<0.062	
1,2-dichlorobenzene	**0.192**	**1.38**	**0.253**	<0.042	50
1,2-dichloroethane	<0.032	<0.032	<0.032	<0.032	6.3
1,2-dichloropropane	<0.028	<0.028	<0.028	<0.028	8.6
1,3,5-trimethylbenzene	**7.87**	**0.162**	**0.093J**	**0.467**	
1,3-butadiene	<0.013	<0.013	<0.013	<0.013	
1,3-dichlorobenzene	<0.042	<0.042	<0.042	<0.042	42
1,4-dichlorobenzene	**0.265**	**0.355**	**0.234**	**0.192**	35
1,4-dioxane	<0.281	<0.281	<0.281	<0.281	40
2,2,4-trimethylpentane	<0.308	<0.308	<0.308	<0.308	
2-butanone	**1.09J**	**1.16J**	**0.292J**	**1.15J**	850
2-hexanone	<0.248	<0.248	<0.248	<0.248	
3-chloropropene	<0.254	<0.254	<0.254	<0.254	
4-Ethyltoluene	**2.54**	<0.381	<0.381	<0.381	
Acetone	**17.2**	**7.03**	**4.2**	**26.4E**	6400
Benzene	**0.112J**	**0.115J**	**0.265J**	**3.03**	160
Benzyl Chloride	<0.334	<0.334	<0.334	<0.334	
Bromodichloromethane	<0.054	<0.054	<0.054	<0.054	9.2
Bromoform	<0.155	<0.155	<0.155	<0.155	150
Bromomethane	<0.031	<0.031	<0.031	<0.031	42
Carbon disulfide	**0.374J**	**3.58**	**0.315J**	**12.8**	
Carbon tetrachloride	**0.384**	**0.44**	**0.447**	<0.050	38
Chlorobenzene	<0.037	<0.037	<0.037	<0.037	160
Chloroethane	<0.019	<0.019	<0.019	**0.069**	
Chloroform	**0.254**	**0.391**	**0.288**	**0.039J**	130
Chloromethane	**0.101J**	**0.207J**	**0.161J**	<0.099	
Cis-1,2-dichloroethene	<0.026	<0.026	<0.026	**0.476**	56
Cis-1,3-dichloropropene	<0.036	<0.036	<0.036	<0.036	41
Cyclohexane	<0.226	<0.226	<0.226	**10.5**	
Dibromochloromethane	<0.068	<0.068	<0.068	<0.068	6.8
Dichlorodifluoromethane	**1.66**	**1.87**	**2.36**	**0.267J**	
Ethanol	**7.22**	**5.13**	**4.30J**	**6.54**	
Ethyl acetate	<0.472	<0.472	<0.472	<0.472	
Ethylbenzene	**0.717**	**0.161**	**0.152**	**0.4**	520
Freon-113	**0.521**	**0.544**	**0.529**	<0.046	
Freon-114	**0.098J**	**0.105J**	**0.112J**	**0.112J**	
Hexachlorobutadiene	<0.117	<0.117	<0.117	<0.117	7.4
Hexane	<0.183	<0.183	<0.183	**14.1**	
Isopropyl alcohol	CND	CND	CND	**18.9**	
Methylene chloride	<0.869	<0.869	<0.869	<0.869	770
MIBK	<0.249	<0.249	<0.249	<0.249	150
MTBE	<0.014	<0.014	<0.014	<0.014	2700
M+p-xylene	**2.86**	**0.608**	**0.573**	**1.36**	1400
n-heptane	<0.227	<0.227	<0.227	**4.96**	
Naphthalene	**24.9**	**1.03**	**0.823**	**0.734**	42
o-xylene	**1.48**	**0.239**	**0.169**	**0.691**	1400
Propylene	**0.268J**	**0.244J**	**0.238J**	**15.5**	
Styrene	**0.038J**	**0.051J**	**0.123**	<0.034	95
Tetrachloroethylene	**2.08**	**3.53**	**3.42**	**0.122J**	98
Tetrahydrofuran	<0.183	<0.183	<0.183	<0.183	
Toluene	**0.795**	**0.505**	**1.42**	**0.98**	3800
Trans-1,2-dichloroethene	<0.024	<0.024	<0.024	**0.103**	56
Trans-1,3-dichloropropene	<0.036	<0.036	<0.036	<0.036	41
Trichloroethene	**0.677**	**1.82**	**2.15**	**0.124**	28
Trichlorofluoromethane	**1.21**	**1.26**	**1.2**	<0.045	
Vinyl acetate	<0.200	<0.200	<0.200	<0.200	
Vinyl bromide	<0.306	<0.306	<0.306	<0.306	
Vinyl chloride	<0.018	<0.018	<0.018	**0.325**	19

TABLE 2

Soil Gas Chemical Analysis Results
Cummings Center, Beverly, MA
March 2015

Sample ID	SG-1	SG-2	SG-3	SG-4	
Sample Location	Building 100 Interior, Suite 157-J	Building 100 Interior, Suite 157-J	Building 100 Interior, Suite 157-J	Building 100 Interior, Suite 157-J	
Sample Type	Soil Gas	Soil Gas	Soil Gas	Soil Gas	MassDEP Residential Sub-Slab
Date Sampled	3/6/2015	3/6/2015	3/6/2015	3/6/2015	Soil Gas Screening Values
Volatile Organic Compounds (µg/m3)					
Air-Phase Petroleum Hydrocarbon Target Analytes - APH (µg/m3)					
1,3-Butadiene	<2.0	<2.0	<2.0	<2.0	
Methyl-tert-butyl ether	<2.0	<2.0	<2.0	<2.0	2700
Benzene	<2.0	<2.0	<2.0	**3.1**	160
Toluene	<2.0	<2.0	<2.0	<2.0	3800
Ethylbenzene	<2.0	<2.0	<2.0	<2.0	520
m- & p- Xylenes	<4.0	<4.0	<4.0	<4.0	1400
o-Xylenes	<2.0	<2.0	<2.0	<2.0	1400
Naphthalene	**28**	<2.0	<2.0	<2.0	42
Air-Phase Petroleum Hydrocarbons - APH (µg/m3)					
C_5-C_8 Aliphatic Hydrocarbons	**50**	**48**	**15**	**1100**	4100
C_9-C_{12} Aliphatic Hydrocarbons	**1900**	**30**	**54**	**3700**	4800
C_9-C_{10} Aromatic Hydrocarbons	**340**	<10	<10	**11**	700

Notes:
Samples collected by FSL Associates, Inc.
Samples submitted to Alpha Analytical of Mansfield, MA
Results presented in µg/m3
CND - Could not be determined in these samples due to a non-target
compound interfering with the
identification and quantification of this compound
J - estimated concentration quantified below reporting limit
E - estimated
BOLD = Detected above laboratory standards
gray shaded = detected above applicable screening value
blue shaded = analytical detection limit above applicable screening value
< = not detected above laboratory detection limit shown
MassDEP Residential Threshold Values are from Public Draft Review Vapor Intrusion Guidance, MassDEP Policy WSC# 14-435, October 2014.

TABLE 3

Comparison of Indoor Air Chemical Analysis Results - Building 100 Suite 157-J
Cummings Center, Beverly, MA
September 2012 to March 2015

Sample ID	S-157-J	S-157-J	S-157-J	S-157-J (Duplicate)	S-157-J	S-157-J (Duplicate)		
Sample Location	Building 100 Interior, Suite 157-J	Building 100 Interior, Suite 157-J	Building 100 Interior, Suite 157-J	Building 100 Interior, Suite 157-J	Building 100 Interior, Suite 157-J	Building 100 Interior, Suite 157-J		
Sample Type	Air	Air	Air	Air	Air	Air	EPA Target Risk: Carcinogenic =	MassDEP Residential Threshold
Date Sampled	9/20/2012 to 9/21/2012	2/4/2013 to 2/5/2013	2/7/2014 to 2/8/2014	2/7/2014 to 2/8/2014	3/6/2015 to 3/8/2015	3/6/2015 to 3/8/2015	1E-06 or HI = 0.1	Values
Volatile Organic Compounds (µg/m3)								
1,1,1-trichloroethane	<0.109	**0.109**	<0.109	<0.109	<0.038	<0.038	520 (HI)	3
1,1,1,2-tetrachloroethane	<0.137	<0.137	<0.137	<0.137	<0.028	<0.028	0.38	
1,1,2,2-tetrachloroethane	<0.137	<0.137	<0.137	<0.137	<0.048	<0.048	0.042	0.04
1,1,2-trichloroethane	<0.109	<0.109	<0.109	<0.109	<0.049	<0.049	0.18	0.15
1,1-dichloroethane	<0.081	<0.081	<0.081	<0.081	<0.028	<0.028	1.8	0.8
1,1-dichloroethene	<0.079	<0.079	<0.079	<0.079	<0.028	<0.028	21 (HI)	0.8
1,2,4-trichlorobenzene	<0.371	<0.371	<0.371	<0.371	<0.074	<0.074	0.21 (HI)	0.4
1,2,4-trimethylbenzene	**19.8**	**54.6**	**19.1**	**22.8**	**15.1**	**17**	0.73 (HI)	
1,2-dibromoethane	<0.154	<0.154	<0.154	<0.154	<0.062	<0.062	0.0047	
1,2-dichlorobenzene	<0.12	<0.12	<0.120	<0.120	<0.042	<0.042	21 (HI)	0.72
1,2-dichloroethane	**0.227**	**0.093**	<0.081	<0.081	**0.077J**	**0.077J**	0.11	0.09
1,2-dichloropropane	<0.092	<0.092	<0.092	<0.092	<0.028	<0.028	0.28	0.12
1,3,5-trimethylbenzene	**5.21**	**13.5**	**5.6**	**6.69**	**4.04**	**4.46**	0.73 (HI)	
1,3-butadiene	**0.058**	**0.051**	**0.091**	**0.119**	**0.058**	**0.066**	0.094	
1,3-dichlorobenzene	<0.12	<0.12	<0.120	<0.120	<0.042	<0.042	21(HI)	0.6
1,4-dichlorobenzene	<0.12	<0.12	<0.120	<0.120	<0.048	<0.048	0.26	0.5
1,4-dioxane	NA	<0.721	<0.721	<0.721	<0.281	<0.281	0.56	0.57
2,2,4-trimethylpentane	<0.934	<0.934	<0.934	<0.934	<0.308	<0.308	N/A	
2-butanone	**2.04**	**1.04**	**4.39**	**6.1**	**1.57**	**1.18J**	520(HI)	12
2-hexanone	<0.82	<0.82	<0.820	<0.820	<0.248	<0.248	3.1(HI)	
3-chloropropene	NA	<0.626	<0.626	<0.626	<0.254	<0.254	0.47	
4-Ethyltoluene	**4.56**	**12.4**	**4.82**	**5.75**	**3.66**	**3.95**	N/A	
Acetone	**70.8**	**51.3**	**32.8**	**44.9**	**33**	**31.4**	3,200(HI)	91
Benzene	**0.323**	**0.696**	**0.795**	**0.843**	**0.827**	**0.767**	0.36	2.3
Benzyl Chloride	NA	<1.04	<1.04	<1.04	<0.334	<0.334	0.057	
Bromodichloromethane	<0.134	<0.134	<0.134	<0.134	<0.054	<0.054	0.076	0.13
Bromoform	<0.207	<0.207	<0.207	<0.207	<0.155	<0.155	2.6	2.1
Bromomethane	<0.078	<0.078	<0.078	<0.078	<0.031	<0.031	0.52(HI)	0.6
Carbon disulfide	<0.623	<0.623	<0.623	<0.623	<0.107	<0.107	73 (HI)	
Carbon tetrachloride	**0.302**	**0.572**	**0.585**	**0.598**	**0.434**	**0.409**	0.47	0.54
Chlorobenzene	<0.092	<0.092	<0.092	<0.092	<0.037	<0.037	5.2 (HI)	2.3
Chloroethane	<0.053	<0.053	<0.053	<0.053	<0.019	**0.032J**	1,000 (HI)	
Chloroform	**0.596**	**0.288**	**0.234**	**0.293**	**0.117**	**0.122**	0.12	1.9
Chloromethane	<1.03	<1.03	**1.05**	**1.23**	**1.1**	**1.13**	9.4 (HI)	
Cis-1,2-dichloroethene	**0.123**	**0.131**	<0.079	**0.099**	**0.107**	**0.131**	N/A	0.8
Cis-1,3-dichloropropene	<0.091	<0.091	<0.091	<0.091	<0.036	<0.036	0.7	0.58
Cyclohexane	**56.4**	<0.688	**5.51**	**6.82**	**25**	**0.334J**	630 (HI)	
Dibromochloromethane	<0.17	<0.17	<0.170	<0.170	<0.068	<0.068	0.1	0.097
Dichlorodifluoromethane	**0.737**	**2.21**	**2.09**	**0.964**	**1.75**	**1.98**	10 (HI)	
Ethanol	**511**	**115**	**183**	**243**	**102**	**84.4**	N/A	
Ethyl acetate	<1.80	<1.80	<1.80	<1.80	<0.472	<0.472	N/A	
Ethylbenzene	**0.586**	**0.964**	**1.21**	**1.4**	**0.495**	**0.482**	1.1	7.4
Freon-113	**0.498**	**0.491**	**0.491**	**0.628**	**0.621**	**0.583**	3,100 (HI)	
Freon-114	<0.349	<0.349	<0.349	<0.349	**0.098J**	**0.105J**	N/A	
Hexachlorobutadiene	<0.533	<0.533	<0.533	<0.533	<0.117	<0.117	0.13	0.11
Hexane	**4.3**	**0.747**	**5.89**	**5**	**0.856**	**0.314J**	73 (HI)	
Isopropyl alcohol	**235 E**	**396 E**	**178**	**256**	**78.4**	**91.7**	21 (HI)	
Methylene chloride	**10.5**	<4.86	**39.6**	<3.47	**16.2**	**2.72**	63 (HI)	11
MIBK	**1.17**	<0.82	<0.820	<0.820	<0.249	<0.249	310 (HI)	2.2
MTBE	<0.072	<0.072	<0.072	<0.072	<0.014	<0.014	11	39
M+p-xylene	**1.71**	**3.21**	**5.13**	**5.91**	**1.53**	**1.45**	10 (HI)	20
n-heptane	NA	<0.820	**1.19**	**1.42**	**0.459J**	**0.402J**	N/A	
Naphthalene	NA	**0.367**	<0.262	**0.267**	**0.173J**	**0.189J**	0.083	0.6
o-xylene	**0.96**	**2.34**	**2.55**	**3.01**	**0.786**	**0.808**	10 (HI)	20
Propylene	<0.86	<0.861	<0.861	**1.03**	**0.503J**	**0.520J**	310 (HI)	
Styrene	**0.588**	**0.379**	**0.179**	**0.213**	**0.17**	**0.149**	100 (HI)	1.4
Tetrachloroethylene	**0.312**	**0.183**	**0.183**	**0.176**	**0.19**	**0.17**	4.2 (HI)	1.4
Tetrahydrofuran	<0.59	<0.59	<0.590	<0.590	<0.183	<0.183	210 (HI)	
Toluene	**2.67**	**2.51**	**2.88**	**2.52**	**3.18**	**3.13**	520 (HI)	54
Trans-1,2-dichloroethene	<0.079	<0.079	<0.079	<0.079	<0.024	<0.024	N/A	0.8
Trans-1,3-dichloropropene	<0.091	<0.091	<0.091	<0.091	<0.036	<0.036	0.7	0.58
Trichloroethene	<0.107	<0.107	<0.107	<0.107	<0.038	<0.038	0.48	0.4
Trichlorofluoromethane	**1.15**	**1.26**	**1.35**	**1.7**	**1.2**	**1.25**	73 (HI)	
Vinyl acetate	NA	<0.704	<0.704	<0.704	<0.200	<0.200	21 (HI)	
Vinyl bromide	NA	<0.874	<0.874	<0.874	<0.306	<0.306	0.088	
Vinyl chloride	<0.051	<0.051	<0.051	<0.051	<0.018	<0.018	0.17	0.27

TABLE 3

Comparison of Indoor Air Chemical Analysis Results - Building 100 Suite 157-J
Cummings Center, Beverly, MA
September 2012 to March 2015

Sample ID	S-157-J	S-157-J	S-157-J	S-157-J (Duplicate)	S-157-J	S-157-J (Duplicate)		
Sample Location	Building 100 Interior, Suite 157-J	Building 100 Interior, Suite 157-J	Building 100 Interior, Suite 157-J	Building 100 Interior, Suite 157-J	Building 100 Interior, Suite 157-J	Building 100 Interior, Suite 157-J		
Sample Type	Air	Air	Air	Air	Air	Air	EPA Target Risk: Carcinogenic =	MassDEP Residential Threshold
Date Sampled	9/20/2012 to 9/21/2012	2/4/2013 to 2/5/2013	2/7/2014 to 2/8/2014	2/7/2014 to 2/8/2014	3/6/2015 to 3/8/2015	3/6/2015 to 3/8/2015	1E-06 or HI = 0.1	Values
Volatile Organic Compounds (µg/m3)								
Air-Phase Petroleum Hydrocarbon Target Analytes - APH (µg/m3)								
1,3-Butadiene	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	0.094	
Methyl-tert-butyl ether	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	11	39
Benzene	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	0.36	2.3
Toluene	**2.3**	**2.5**	**2.9**	**2.6**	**3.2**	**3.3**	520 (HI)	54
Ethylbenzene	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	0.97	7.4
m- & p- Xylenes	<4.0	<4.0	**5**	**5.7**	<4.0	<4.0	10 (HI)	20
o-Xylenes	<2.0	**2.3**	**2.4**	**3**	<2.0	<2.0	10 (HI)	20
Naphthalene	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	0.083	0.6
Air-Phase Petroleum Hydrocarbons - APH (µg/m3)								
C_5-C_8 Aliphatic Hydrocarbons	**320**	**41**	**66**	**53**	**38**	<12	N/A	58
C_9-C_{12} Aliphatic Hydrocarbons	**190**	**200**	**230**	**270**	**130**	**140**	N/A	68
C_9-C_{10} Aromatic Hydrocarbons	**61**	**160**	**61**	**72**	**45**	**51**	N/A	10

Notes:
Samples collected by Geosphere Environmental Management
Samples submitted to Alpha Analytical of Mansfield, MA
Results presented in µg/m3
NA - Not Analyzed
E - estimated
J - estimated concentration quantified below reporting limit
BOLD = Detected above laboratory standards
gray shaded = detected above applicable standard
blue shaded = analytical detection limit above applicable standard
< = not detected above laboratory detection limit shown
EPA Target Risk Levels are from Regional Screening Level Resident Air Supporting Table, November 2014. Values preceding "(HI)" indicate compounds that are not considered to be carcinogenic and risk levels are based on noncarcinogenic risk. "N/A" indicates compounds with no risk information available from this source.
MassDEP Residential Threshold Values are from Interim Final Vapor Intrusion Guidance, MassDEP Policy WSC# 14-435, October 2014.

TABLE 3

Comparison of Indoor Air Chemical Analysis Resul
Cummings Center, Beverly, MA
September 2012 to March 2015

Sample ID	S-157-J.1	S-157-J.1	S-157-J.2	S-157-J.2		
Sample Location	Building 100 Interior, Suite 157-J	Building 100 Interior, Suite 157-J	Building 100 Interior, Suite 157-J	Building 100 Interior, Suite 157-J		
Sample Type	Air	Air	Air	Air	EPA Target Risk: Carcinogenic =	MassDEP Residential Threshold
Date Sampled	2/7/2014 to 2/8/2014	3/6/2015 to 3/8/2015	2/7/2014 to 2/8/2014	3/6/2015 to 3/8/2015	1E-06 or HI = 0.1	Values
Volatile Organic Compounds (µg/m3)						
1,1,1-trichloroethane	<0.109	<0.038	<0.109	<0.038	520 (HI)	3
1,1,1,2-tetrachloroethane	<0.137	<0.028	<0.137	<0.028	0.38	
1,1,2,2-tetrachloroethane	<0.137	<0.048	<0.137	<0.048	0.042	0.04
1,1,2-trichloroethane	<0.109	<0.049	<0.109	<0.049	0.18	0.15
1,1-dichloroethane	<0.081	<0.028	<0.081	**0.077J**	1.8	0.8
1,1-dichloroethene	<0.079	<0.028	<0.079	<0.028	21 (HI)	0.8
1,2,4-trichlorobenzene	<0.371	<0.074	<0.371	<0.074	0.21 (HI)	0.4
1,2,4-trimethylbenzene	**22.4**	**15.1**	**22.9**	**14.6**	0.73 (HI)	
1,2-dibromoethane	<0.154	<0.062	<0.154	<0.062	0.0047	
1,2-dichlorobenzene	<0.120	<0.042	<0.120	<0.042	21 (HI)	0.72
1,2-dichloroethane	<0.081	**0.065J**	<0.081	<0.032	0.11	0.09
1,2-dichloropropane	<0.092	<0.028	<0.092	<0.028	0.28	0.12
1,3,5-trimethylbenzene	**6.49**	**3.74**	**6.69**	**3.95**	0.73 (HI)	
1,3-butadiene	**0.142**	**0.064**	**0.115**	**0.071**	0.094	
1,3-dichlorobenzene	<0.120	<0.042	<0.120	<0.042	21(HI)	0.6
1,4-dichlorobenzene	<0.120	<0.048	<0.120	<0.048	0.26	0.5
1,4-dioxane	<0.721	<0.281	<0.721	<0.281	0.56	0.57
2,2,4-trimethylpentane	<0.934	<0.308	<0.934	<0.308	N/A	
2-butanone	**6.37**	**1.12J**	**6.02**	**1.24J**	520(HI)	12
2-hexanone	<0.820	<0.248	<0.820	<0.248	3.1(HI)	
3-chloropropene	<0.626	<0.254	<0.626	<0.254	0.47	
4-Ethyltoluene	**5.46**	**3.75**	**6.15**	**3.49**	N/A	
Acetone	**48.9**	**25.2**	**43.2**	**28.0**	3,200(HI)	91
Benzene	**0.974**	**0.815**	**0.93**	**0.898**	0.36	2.3
Benzyl Chloride	<1.04	<0.334	<1.04	<0.334	0.057	
Bromodichloromethane	<0.134	<0.054	<0.134	<0.054	0.076	0.13
Bromoform	<0.207	<0.155	<0.207	<0.155	2.6	2.1
Bromomethane	<0.078	<0.031	<0.078	<0.031	0.52(HI)	0.6
Carbon disulfide	<0.623	<0.107	<0.623	<0.107	73 (HI)	
Carbon tetrachloride	**0.642**	**0.434**	**0.642**	**0.44**	0.47	0.54
Chlorobenzene	<0.092	<0.037	<0.092	<0.037	5.2 (HI)	2.3
Chloroethane	<0.053	<0.019	<0.053	<0.019	1,000 (HI)	
Chloroform	**0.332**	**0.103**	**0.278**	**0.107**	0.12	1.9
Chloromethane	**1.32**	**1.07**	**1.11**	**1.12**	9.4 (HI)	
Cis-1,2-dichloroethene	**0.111**	**0.103**	**0.095**	**0.107**	N/A	0.8
Cis-1,3-dichloropropene	<0.091	<0.036	<0.091	<0.036	0.7	0.58
Cyclohexane	**7.68**	**0.826**	**7.09**	**0.379J**	630 (HI)	
Dibromochloromethane	<0.170	<0.068	<0.170	<0.068	0.1	0.097
Dichlorodifluoromethane	**1.11**	**1.62**	**1.67**	**1.84**	10 (HI)	
Ethanol	**279**	**70.1**	**220**	**72.9**	N/A	
Ethyl acetate	<1.80	<0.472	<1.80	<0.472	N/A	
Ethylbenzene	**1.61**	**0.456**	**1.55**	**0.439**	1.1	7.4
Freon-113	**0.927**	**0.506**	**0.552**	**0.529**	3,100 (HI)	
Freon-114	<0.349	**0.091J**	<0.349	**0.098J**	N/A	
Hexachlorobutadiene	<0.533	<0.117	<0.533	<0.117	0.13	0.11
Hexane	**5.29**	**0.458J**	**5.92**	**0.483J**	73 (HI)	
Isopropyl alcohol	**244**	**75.2**	**219**	**82.1**	21 (HI)	
Methylene chloride	<3.47	**2.08**	<3.47	**2.16**	63 (HI)	11
MIBK	<0.820	<0.249	<0.820	<0.249	310 (HI)	2.2
MTBE	<0.072	<0.014	<0.072	<0.014	11	39
M+p-xylene	**6.6**	**1.37**	**6.43**	**1.34**	10 (HI)	20
n-heptane	**1.8**	**0.451J**	**1.7**	**0.602J**	N/A	
Naphthalene	<0.262	**0.184J**	<0.262	**0.178J**	0.083	0.6
o-xylene	**3.11**	**0.751**	**3.15**	**0.721**	10 (HI)	20
Propylene	**0.981**	**0.401J**	<0.861	**0.534J**	310 (HI)	
Styrene	**0.341**	**0.132**	**0.26**	**0.128**	100 (HI)	1.4
Tetrachloroethylene	**0.251**	**0.136**	**0.217**	**0.156**	4.2 (HI)	1.4
Tetrahydrofuran	<0.590	<0.183	<0.590	<0.183	210 (HI)	
Toluene	**4.56**	**2.25**	**5.58**	**2.29**	520 (HI)	54
Trans-1,2-dichloroethene	<0.079	<0.024	<0.079	<0.024	N/A	0.8
Trans-1,3-dichloropropene	<0.091	<0.036	<0.091	<0.036	0.7	0.58
Trichloroethene	**0.113**	**0.070J**	<0.107	**0.107**	0.48	0.4
Trichlorofluoromethane	**1.82**	**1.16**	**1.49**	**1.2**	73 (HI)	
Vinyl acetate	<0.704	<0.200	<0.704	<0.200	21 (HI)	
Vinyl bromide	<0.874	<0.306	<0.874	<0.306	0.088	
Vinyl chloride	<0.051	<0.018	<0.051	<0.018	0.17	0.27

TABLE 3

Comparison of Indoor Air Chemical Analysis Resul
Cummings Center, Beverly, MA
September 2012 to March 2015

Sample ID	S-157-J.1	S-157-J.1	S-157-J.2	S-157-J.2		
Sample Location	Building 100 Interior, Suite 157-J	Building 100 Interior, Suite 157-J	Building 100 Interior, Suite 157-J	Building 100 Interior, Suite 157-J		
Sample Type	Air	Air	Air	Air	EPA Target Risk: Carcinogenic =	MassDEP Residential Threshold
Date Sampled	2/7/2014 to 2/8/2014	3/6/2015 to 3/8/2015	2/7/2014 to 2/8/2014	3/6/2015 to 3/8/2015	1E-06 or HI = 0.1	Values
Volatile Organic Compounds (µg/m3)						
Air-Phase Petroleum Hydrocarbon Target Analytes - APH (µg/m3)						
1,3-Butadiene	<2.0	<2.0	<2.0	<2.0	0.094	
Methyl-tert-butyl ether	<2.0	<2.0	<2.0	<2.0	11	39
Benzene	<2.0	<2.0	<2.0	<2.0	0.36	2.3
Toluene	**4.7**	**2.2**	**5.8**	**2.5**	520 (HI)	54
Ethylbenzene	<2.0	<2.0	<2.0	<2.0	0.97	7.4
m- & p- Xylenes	**6.5**	<4.0	**6.6**	<4.0	10 (HI)	20
o-Xylenes	**3.2**	<2.0	**3.1**	<2.0	10 (HI)	20
Naphthalene	<2.0	<2.0	<2.0	<2.0	0.083	0.6
Air-Phase Petroleum Hydrocarbons - APH (µg/m3)						
C_5-C_8 Aliphatic Hydrocarbons	**58**	<12	**55**	**14**	N/A	58
C_9-C_{12} Aliphatic Hydrocarbons	**270**	**120**	**270**	**110**	N/A	68
C_9-C_{10} Aromatic Hydrocarbons	**71**	**46**	**74**	**43**	N/A	10

Notes:
Samples collected by Geosphere Environmental Management
Samples submitted to Alpha Analytical of Mansfield, MA
Results presented in µg/m3
NA - Not Analyzed
E - estimated
J - estimated concentration quantified below reporting limit
BOLD = Detected above laboratory standards
gray shaded = detected above applicable standard
blue shaded = analytical detection limit above applicable standard
< = not detected above laboratory detection limit shown
EPA Target Risk Levels are from Regional Screening Level Resident Air Supportin
2014. Values preceding "(HI)" indicate compounds that are not considered to
levels are based on noncarcinogenic risk. "N/A" indicates compounds with no
from this source.
MassDEP Residential Threshold Values are from Interim Final Vapor Intrusion Gu
Policy WSC# 14-435, October 2014.

Appendix A

Sub-Slab Soil Gas Sampling Standard Operating Procedure

STANDARD OPERATING PROCEDURE: SUB-SLAB SOIL GAS SAMPLING

February, 2015

FSL Associates, Inc.
358 Chestnut Hill Avenue
Boston, MA 02135
(617) 232-0001
(617) 232-7800
www.fslassociates.com

1.0 Introduction

This standard operating procedure (SOP) for sub-slab soil gas sampling has been developed by FSL Associates, Inc. (FSL) based upon sampling manuals published by the Massachusetts Department of Environmental Protection (MADEP) and the United States Environmental Protection Agency (US EPA). FSL's sub-slab soil gas sampling procedure described in this SOP will be followed unless different protocols are specifically requested by MADEP or the US EPA in writing in advance of any such sampling event.

Sub-slab soil gas sampling is conducted to determine the concentrations of volatile organic compounds (VOCs) in soil gas underlying a structure with slab flooring. The results of the sub-slab soil gas sampling can be used to determine the potential for vapor intrusion into the overlying structure. Sub-slab soil gas samples can be collected from a variety of locations such as commercial properties, construction sites, and even residential homes. Contaminants likely to be found in sub-slab soil gas can include lighter molecular weight compounds in the gaseous form, aerosols, or solid particulates composed of metal or some other material, such as carbon, onto which volatiles may be adsorbed. The VOCs can largely include either hydrocarbons, as are found in petroleum and substituted carbon compounds such as chlorinated hydrocarbons. A variety of other compounds such as ethers, carbonyls, and alcohols among others may also be present in sub-slab soil gas. This SOP will discuss the appropriate techniques used in collecting sub-slab soil gas samples to evaluate the potential for vapor intrusion into an overlying structure.

2.0 Purpose

The purpose of this sub-slab soil gas sampling SOP is to outline field sampling point installation and sampling techniques for collecting representative and consistent samples of sub-slab soil gas for analysis by a laboratory or field instruments. This is accomplished through careful and consistent sampling techniques described in this SOP.

3.0 Sample Point Installation

FSL sub-contracts the installation of permanent sub-slab soil gas sampling points to a third party: Eastern Analytical, Inc. (EAI) of 25 Chenell Drive, Concord, NH 03301. EAI's SOP for installing permanent sub-slab soil gas sample points is summarized in sections 3.1 to 3.2 below and is included as an appendix to this SOP.

3.1 Sampling Point Installation Equipment Requirements

The following pieces of equipment are used by EAI during the sampling point installation process:

- Makita rotary hammer with a 1 ½" drill bit
- Dewalt cordless hammer drill with a 3/8" drill bit
- Extension cords
- Shop vacuum
- 1/4" Stainless steel (S.S.) Probe
- Modeling clay, hydraulic cement, or Portland cement
- Water
- Wrenches and allen wrenches
- Ferrules
- Tubing cutter

- Probe parts and fittings
- ¼" NPT flush plug
- Teflon thread tape
- Paper towels
- Hand-held broom

3.2 Sampling Point Installation Procedure

A.) Install 1 ½" drill bit into the hammer drill and drill to a depth no greater than 2". Vacuum concrete dust from the hole.

B.) Install 3/8" drill bit into the cordless hammer drill and drill the rest of the way through the slab. Record the total depth or thickness, of the concrete. This will be the total length of the sampling probe. Vacuum dust from the hole carefully so as not to draw any vapor from beneath the slab – as little as possible.

C.) Assemble the probe. The S.S. female adapter's overall length is 1 ½". Cut the S. S. ¼" tubing so that it and the female adapter add up to the thickness of the concrete. Install a ¼" NPT plug in the female adapter and tighten. The goal is to have the bottom of the probe flush with the underside of the slab. In cases where the slab is only a few inches thick, omit the S.S. tubing and install the female adapter only.

D.) Saturate a paper towel with water and dab the inside of the hole to remove any leftover dust from drilling and to moisten the concrete. Moistening the concrete will help the cement poured in later to adhere better and reduce shrinkage and cracking during the drying process.

E.) Remove a small amount of modeling clay, about the size of a ping pong ball, and wrap it around the S.S. tubing on the probe just below the compression nut.

F.) Install the probe into the hole. Push the probe down, forcing the modeling clay into the 3/8" hole. Using a straight edge, ensure ¼" NPT flush plug is flush with the grade so it is not a trip hazard. The female adapter will be approximately ¼" below grade.

G.) Using a pencil eraser or similar, spread the clay around the bottom of the 1 ½" hole to form as tight a seal as possible.

H.) Mix a small amount of cement and fill the annulus around the probe.

I.) Fill to the top of the female adapter only, do not get cement on the threads of the plug or in the probe.

J.) Record the probe description, identification, depth, diameter, volume, on vapor sampling field log.

4.0 Sampling Equipment Requirements

The following equipment is required during typical sub-slab soil gas sampling programs:

- Hand-held Direct-Measuring Screening Device (such as a Photoionization Detection (PID) or Flame Ionization Detector (FID));
- Laboratory provided evacuated canisters (i.e. Summa) or tedlar bags, and appropriate hardware;
- 1/4" Teflon tubing;
- C-Flex tubing;
- 1/4" Swage-lock tube fittings and male connectors;
- 1/4" Allen wrench;
- 9/16" Wrench;

- Tracer gas with associated container OR plastic surfactant applicator with surfactant;
- Field book and air sampling log sheet; and
- Chain of custody document.

4.1 Advantages and Disadvantages of Certain Equipment

Some advantages and disadvantages in using certain types of direct-measuring field screening devices and sample collection devices are listed below. Further information can be gained from the references.

4.1.1 General Screening Devices

FSL typically uses a Photoionization Detector (PID) in order to evacuate sub-slab soil gas from the permanent sub-slab soil gas sampling point prior to sample collection. PID readings obtained during this process are recorded. The advantage of using a PID is that it is simple to calibrate and operate in the field. The equipment is also lightweight and easy to transport. Disadvantages of the PID include low sensitivity and low specificity; only total volatile concentrations are detected at concentrations exceeding 100 parts per billion.

4.1.2 Evacuated Canisters

FSL typically uses evacuated canisters in order to conduct indoor air sampling. The advantage of using evacuated canisters is that they are lightweight and compact and simple to operate in the field. They are also capable of detecting low part per billion concentrations of specific contaminants. Evacuated canisters can be used to collect grab or integrated samples over time. Disadvantages include higher costs than alternative methods and the canisters may require special handling to prevent sample deterioration during transport to the laboratory for analysis.

5.0 Sampling Procedure

The sub-slab soil gas sampling procedure is as follows:

1.) Ensure PID has been calibrated recently (within approximately 1 month of the sampling process). If the PID has not been calibrated within this time-frame, proceed to do so outdoors in accordance with the calibration procedures specified by the equipment manufacturer;
2.) Sweep dust and debris from around the soil gas sampling point probe;
3.) Remove the 1/4" flush plug from the probe using the 1/4" allen wrench;
4.) Screw the 1/4" swage lock male connector into the probe using the 9/16” wrench;
5.) After cutting the desired amount of 1/4" Teflon tubing, run the tubing through the 1/4” swage lock fitting and screw the fitting onto the male connector using the 9/16” wrench;
6.) Connect approximately 4 to 5 inches of C-flex tubing to the end of the 1/4" Teflon tubing;
7.) Connect the C-flex tubing to the PID and evacuate the sampling point for 1 minute, recording PID readings in field book;
8.) While evacuating the sampling point, spray surfactant over the sample point, connector, and fitting assembly where the 1/4" Teflon tubing is connected to the sample point. Note the presence or any formation of bubbles which would be indicative of a short-circuit in the

sample point. If short-circuiting is observed, abandon the sampling of the sample point until it has been repaired so as to provide a sealed system when sampling occurs;

9.) Remove the C-flex tubing and connect the 1/4" Teflon tubing to the Summa canister regulator using an additional 1/4" swage lock connector and fitting.
The connector and fitting should be tightened using the 9/16" wrench. The connector and fitting should not be over-tightened so as to prevent damaging the regulator and Summa canister equipment;

10.) Fill out a label with the sample ID, date, analysis needed, and attach it to the Summa canister;

11.) Open Summa canister valve by turning the knob counter-clockwise until there's no resistance, then tighten to the point that resistance is felt;

12.) The sample is now being collected;

13.) Note the pressure reading on the Summa canister gauge and the start time. Log these on the air sampling log sheet and also the label on the Summa canister;

14.) The sample is to be collected over a 30 minute time period;

15.) While the sample is being collected, log the Summa canister ID and regulator ID numbers on the air sampling log sheet and chain of custody;

16.) Log the final pressure and stop time and close the valve on the Summa canister once 30 minutes have elapsed since the start of sample collection;

17.) Ensure the valve is closed, then remove the regulator (if required by the laboratory);

18.) Relinquish the Summa canister sample(s) to the laboratory under Chain of Custody with: sample date, sample site address, sample location, sample I.D. number, Summa canister serial no., regulator serial number, analysis/analyses requested, and desired turn-around-time.

6.0 References

- *Sampling Instructions for Soil Vapor Composite Sampling Using Canisters*, Alpha Analytical, Mansfield, MA, January, 2011
- *Standard Operating Procedure: Sub-Slab Vapor Intrusion Collection*, Eastern Analytical, Inc., 33 Chenell Drive, Concord, NH, August 28, 2009
- *Development of a Sub-Slab Gas Sampling Protocol to Support Assessment of Vapor Intrusion*, United States Environmental Protection Agency

Sampling Instructions for Soil Vapor Composite Sampling Using Canisters

1. Remove plastic cap from the flow controller outlet. Check to see that the o-ring is still in place on the VCO fitting. Extra o-rings and ferrules are located on the inside cover of the shipping container. Remove valve plug from canister inlet.

2. Connect the flow controller outlet to the canister inlet; hand-tight will suffice since this is an o-ring fitting.

3. Press the ON/OFF button to turn digital gauge on. Units should be in "in. Hg". Re-zero if necessary by pressing the "ZERO" button. Gauge will automatically turn off after 20 minutes.

4. Attach tubing (if necessary) to the ¼ in. fitting (Teflon ferrule included) on the flow controller inlet. See figure for details.

5. Open the valve on the canister; the vacuum gauge should drop from zero to at least 28 in. Hg. If the gauge does not decrease to 28 in. Hg, the canister may have developed a leak and should not be used for sampling. Record the start time on the canister label.

6. Allow canister to fill for the duration of the sampling period (i.e. 1 hr., 2 hr.). After the composite time has elapsed, close the valve on the canister. DO NOT OVER-TIGHTEN. The vacuum gauge should be near 5 in. Hg; the flow controller is calibrated so that the composite will complete without completely filling the canister. This ensures that a constant flow was maintained throughout the sampling event.

7. Disconnect the tubing from the flow controller and the flow controller from the canister. Re-attach the plastic cap on the flow controller outlet. Re-install the valve plug on the canister inlet. Record the end time on the canister label.

8. Chain of Custody documentation: record the sample ID, canister serial # and the flow controller serial #. Record start/stop sampling times and vacuum readings (to one decimal place only).

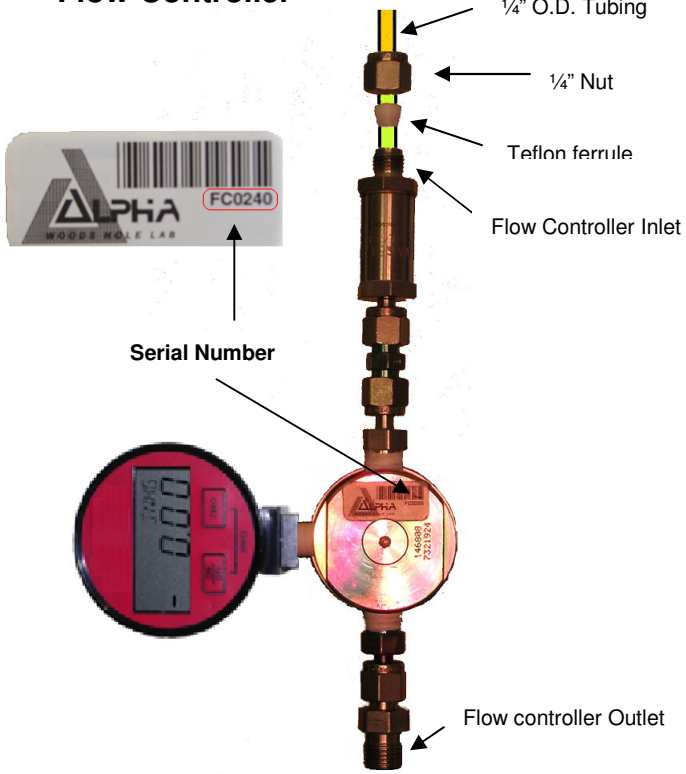
DO NOT STICK ANY LABELS ONTO THE CANISTER OR WRITE ON THE CANISTER. PLEASE USE THE MANILA TAG ATTACHED TO THE CANISTER.

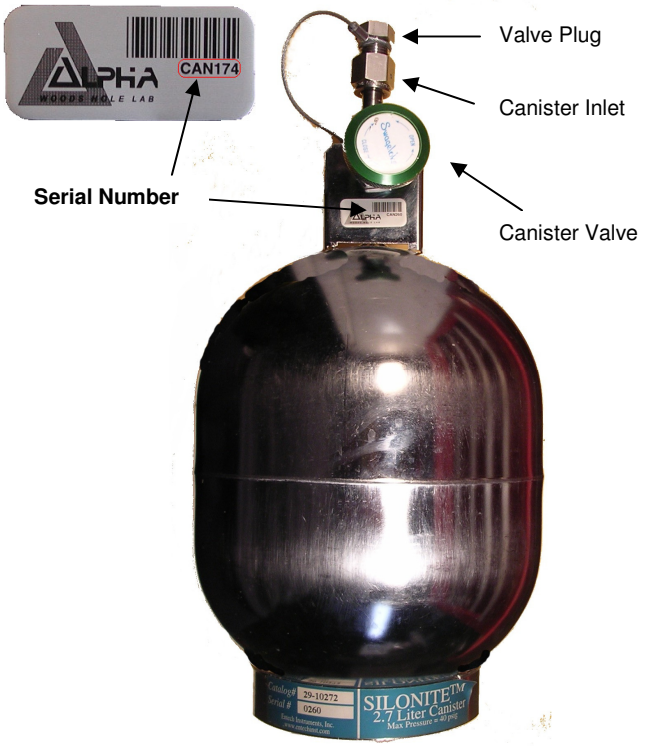
Rental Terms and Conditions

Canisters are supplied free of charge for two weeks. A $10 per calendar day rental fee will be assessed for each canister after two weeks. A cleaning fee of $54 will be assessed for any canister returned to the laboratory unused. A replacement fee of $500 will be charged for any canister that is damaged or not returned to the laboratory.

Calibrated flow controllers are supplied at a cost of $27 for an initial two week period. A $27 per 2 week rental fee will be assessed for each flow controller after two weeks**.** A replacement fee of $750 will be charged for any flow controller that is damaged or not returned to the laboratory.

Flow Controller





Canister

See Reverse for Troubleshooting Guide

Sampling Instructions for Soil Vapor Composite Sampling Using Canisters

Soil Vapor Sampling - Troubleshooting Guide

1. Digital vacuum gauge-additional instructions:

    a. Units should be in in. Hg. To change units, press and hold both the ON/OFF and ZERO button. Allow display to scroll through and stop at the in. Hg unit.

    b. If a vacuum gauge is not functioning, vacuum readings can be obtained using a second flow controller (if available) or an independent vacuum gauge. Independent vacuum gauges are available upon request from the laboratory.

2. A problem often encountered with soil vapor sampling is that there is simply insufficient vapor available to fill the canister, possibly due to tight soil conditions or high moisture content. Canister samples collected under these conditions may not fill the canister completely. At a minimum, the canisters should reach a pressure of -15 in Hg in order to have a valid sample.

3. If at the end of the sampling event, the canister has not reached a pressure of -15 in. Hg, then the laboratory may have to pressurize the canister slightly in order to have an acceptable level of pressure in the canister to conduct analysis. This pressurization of the canister will result in a dilution factor of 2-3 fold being applied to the final results.

4. The valve must be manually closed at the end of the designated sampling period (i.e. 24 hr) in order for the canister to stop sampling. If valve is not closed, canister will continue sampling for a short period of time until the canister pressure is equal to ambient pressure.

5. If additional assistance is needed, please contact Alpha's Mansfield laboratory at **508-822-9300**.

See Reverse for Sampling Instructions

EAI SOP: QA9616002_SubSlab_VI
STANDARD OPERATING PROCEDURE
Sub-Slab Vapor Intrusion Collection

SOP Effective Date: 08/28/2009 Replaces SOP: FS SOP Sub Slab VI

Prepared by: _____ Date: 07-26-11
Analyst

Reviewed by: _____ Date: 07-26-11
Technical Director

Approved by: Kathleen Noonan Kelley Date: 07-26-11
QC Officer

1.0 SCOPE AND APPLICATION

1.1 This SOP covers the steps and equipment required to collect sub-slab, sub-cellar vapor intrusion samples using a helium tracer in residential and commercial buildings. This is a summary SOP for internal use by EAI. The procedures outlined by the NHDES Soil Vapor Intrusion Guidance document are followed with the addition of laboratory specific enhancements described below.

1.2 Definitions: All applicable definitions can be found in the EAI QA Manual.

2.0 SUMMARY OF METHOD

2.1 Eastern Analytical, Inc. uses an in house fabricated sampling system to ensure the collection of clean, representative samples with a limited potential for cross contamination. Two days are required for an initial event.

2.1.1 Day one, a stainless steel (S.S.) probe will be installed flush with grade and the annulus sealed.

2.1.2 Day two, a helium chamber will be installed around the sub-slab probe and sealed.

2.1.3 Soil vapor is screened for oxygen, methane and carbon dioxide, values are recorded.

2.1.4 Helium is introduced into the chamber and tightness/ leaks will be verified using a helium detector.

2.1.5 After tightness verification samples are collected.

2.1.5.1 Samples are collected into stainless steel Summa Cans and can be analyzed for a variety of constituents, i.e.; petroleum hydrocarbons, chlorinated solvents, helium, methane, radon, to name a few.

3.0 INTERFERENCES

3.1 Extremely dense or wet soils may not be suitable for soil vapor testing.

3.2 Soil or other debris in the threads of the probe adapter and compression ferrules will not allow a tight seal. Ensure all equipment and threads are clean.

3.3 Soil or other debris on slab will not allow helium chamber to seal properly thus potentially incurring a false positive during tracer screening.

3.4 Other interferences may be found in the NHDES Soil Vapor Intrusion Guidance document.

4.0 APPARATUS

4.1 Makita Rotary Hammer

4.1.1 1 1/2" Drill Bit

4.2 Dewalt Cordless Hammer Drill

4.2.1 3/8" Drill Bit

4.3 Extension Cords

4.4 Shop Vacuum
4.5 Probe materials
4.5.1 ¼" S.S. Probe
4.5.2 ¼" HDPE Tubing
4.5.3 Female Adapter
4.5.4 Compression Ferrules and Nut
4.5.5 Sampling adapter
4.6 Modeling Clay, Hydraulic Cement or Portland Cement
4.6.1 Water
4.7 VI Tool Box
4.7.1 Wrenches
4.7.2 Allen Wrenches
4.7.3 Ferrules
4.7.4 Tubing Cutter
4.7.5 Probe Parts and Fittings
4.7.6 ¼" NPT flush plug
4.7.7 Teflon Thread Tape
4.8 Helium Tank
4.8.1 Regulator
4.9 Helium Chamber
4.9.1 Base Gasket
4.10 Helium Detector
4.11 ¼" HDPE (poly) Tubing
4.12 ¼" PTFE (Teflon) Tubing
4.13 ¼" S.S. Ferrules
4.14 ¼" PTFE Ferrules
4.15 Vacuum Pump
4.16 Summa Cans
4.16.1 Critical Orifices or Flow Regulator
4.16.2 Vacuum Gauges
4.17 Paper Towels
4.18 3 Liter Tedlar Bag
4.19 Hand Held Broom
4.20 Vapor Intrusion Field Log Sheets
4.21 LandTec GA-90 LF Gas Meter
4.22 Thermo 580 B OVM

5.0 PROCEDURE
5.1 Day One, Probe Installation.
5.1.1 Install 1 1/2" drill bit into the hammer drill and drill to a depth no greater than 2". Vacuum concrete dust from the hole.
5.1.2 Install 3/8" drill bit into cordless hammer drill and drill the rest of the way through the slab. Record the total depth or thickness, of the concrete. This will be the total length of the sampling probe. Vacuum dust from the hole carefully so as not to draw any vapor from beneath the slab - as little as possible anyways.
5.1.3 Assemble the probe. The S.S. female adapter's overall length is 1 1/2". Cut the S.S. 1/4" tubing so that it and the female adapter add up to the thickness of the concrete. Install a 1/4" NPT plug in the female adapter and tighten. The goal is to have the bottom of the probe flush with the underside of the slab.
5.1.3.1 In cases where the slab is only a few inches thick omit the S.S. tubing and install the female adapter only.
5.1.4 Saturate a paper towel with water and dab the inside of the hole to remove any left over dust from drilling and to moisten the concrete. Moistening the concrete will help the cement poured in later to adhere better and reduce shrinkage and cracking during the drying process.

5.1.5 Remove a small amount of modeling clay, about the size of a ping pong ball, and wrap it around the S.S. tubing on the probe just below the compression nut.
5.1.5.1 Install the probe into the hole. Push the probe down, forcing the modeling clay into the 3/8" hole. Using a straight edge ensure 1/4" NPT flush plug is flush with the grade so it is not a trip hazard. The female adapter will be approximately 1/4" below grade.
5.1.5.2 Using a pencil eraser or similar, spread the clay around the bottom of the 1 1/2" hole to form as tight a seal as possible.
5.1.6 Mix a small amount of cement and fill the annulus around the probe.
5.1.6.1 Fill to the top of the female adapter only, do not get cement on the threads of the plug or in the probe.
5.1.7 Record probe description, identification, depth, diameter, volume, on vapor sampling field log.

5.2 Day Two, Sampling
5.2.1 Calibrate LandTec GA-90 and Thermo 580 B. Calibrate meters outside and up wind of any possible contamination.
5.2.2 Sweep dust and debris from around probe.
5.2.3 Remove 1/4" flush plug from probe.
5.2.4 Apply a liberal amount of teflon tape to probe sampling adapter, install and tighten snugly.
5.2.5 Place chamber bottom gasket over probe with yellow side down on concrete.
5.2.6 Install new HDPE sample tubing inside chamber.
5.2.6.1 All connections must include a S.S. compression nut, a S.S. or teflon ferrule and a brass insert inside the tubing. This tube will go from the probe to the brass three-way valve's center port. Leave enough sample tubing to go from the brass valve to outside the chamber when it is up right.
5.2.6.2 From the left side of the brass valve run new tubing through the bulk head fitting at the top of the chamber, this is the upper or outer sample tube. Leave enough extra tubing to reach the Summa can - approximately two feet worth. Set chamber aside.
5.2.7 Helium Gas Flow Calibration
5.2.7.1 Install flow regulator on helium tank. Install HDPE tubing on regulator so it is long enough to reach chamber.
5.2.7.2 Close flow regulator by turning T handle counter clock wise. Open tank's main valve, counter clockwise.
5.2.7.3 Connect tubing from the tank to the small S.S. valve at the base of the chamber.
5.2.7.3.1 This will route the helium through the flow meter.
5.2.7.4 Open small S.S. valve
5.2.7.5 Turn brass valve to "sampling" side. Make sure chamber is upright and as level as possible.
5.2.7.6 Open the chamber's flow regulating valve fully, counter clockwise, until it stops.
5.2.7.6.1 This valve is a black knob next to the flow meter gauge.
5.2.7.7 Slowly open helium regulator, clockwise, until flow meter gauge reads 200mL/min or less.
5.2.7.8 When flow meter gauge reads 200mL/min or less, close the main valve on the helium tank and disconnect tube from small valve.
5.2.7.8.1 Do not disturb regulator valve once the helium flow rate has been set.
5.2.7.9 Record helium flow rate.
5.2.7.10 Connect the vacuum pump to the tubing that comes out of the bottom of the chamber's flow regulating valve.
5.2.7.11 Turn brass valve to "screening".
5.2.7.12 Turn the pump on and allow it to run.
5.2.7.12.1 After a minute, close small S.S. valve.
5.2.7.13 Allow another several minutes to purge helium out of the tubing, flow meter and flow valve.
5.2.7.13.1 Check pump exhaust with helium detector to ensure purge is complete.
5.2.7.14 When purge is complete turn chamber flow valve in until the flow meter reads 100mL/min.
5.2.7.14.1 Turn pump off.

5.2.7.15 After the helium has been fully purged, connect the inside, or lower, sample tubing to the vapor probe and set the chamber on the bottom gasket.
5.2.7.15.1 Push down firmly to seat the chamber on gasket.
5.2.8 Preparation for Sampling, Field Screening
5.2.8.1 Turn brass valve to "screening" turn on pump.
5.2.8.2 Open the valve on the three liter Tedlar bag, counter clock wise, and connect to the exhaust port of the vacuum pump. Fill the Tedlar bag with soil vapor.
5.2.8.2.1 Take caution not to overfill and rupture the bag.
5.2.8.3 Remove the bag once full and close the valve.
5.2.8.3.1 Turn off pump.
5.2.8.4 Turn on the LandTec and Thermo meters.
5.2.8.5 Open valve on Tedlar bag and connect to the meters.
5.2.8.5.1 A tee fitting can be used/fabricated in the field to sample with both meters simultaneously.
5.2.8.6 Record meter values on vapor sampling field log sheet. CH4, CO2, O2 and TVOC's
5.2.9 Helium Leak Check
5.2.9.1 Connect helium tubing to the top center fitting on the chamber and open the main valve on the helium tank.
5.2.9.1.1 You should now be introducing helium into the chamber at 200 mL/min.
5.2.9.2 Monitor the chambers exhaust port, on the back of the chambers base plate, with the helium detector.
5.2.9.2.1 When helium is present, the chamber is now full of helium.
5.2.9.3 Connect sample tubing from the top of the chamber to the small S.S. valve.
5.2.9.4 Turn brass valve to "sample" and small S.S. valve to open.
5.2.9.5 Turn pump on. Slowly increase sample flow until flow meter reads 200mL/min or less.
5.2.9.5.1 Do not exceed 200mL/min.
5.2.9.6 Place helium detectors wand at the exhaust port of the vacuum pump.
5.2.9.6.1 Do not connect the two, the detector will draw sample faster than the pump is exhausting, detector damage may result.
5.2.9.7 Monitor detector for any helium readings as this will indicate a leak. Minor helium leaks are not a cause for concern.
5.2.9.7.1 If readings over 10% of applied concentration occur, check and tighten all fittings and retry.
5.2.9.7.2 If readings above 10% of applied concentration still exist, seal around probe, and any nearby cracks in the concrete, with a bentonite slurry, retry.
5.2.9.8 When helium readings are satisfactory, close main valve to helium tank. (ex. If 100% helium is applied to the point, divide detected ppm concentration by 10,000 to calculate leak %.)
5.2.10 Summa Can Sampling
5.2.10.1 Grab a Summa can and remove the cap from the top of the can.
5.2.10.2 Attach a pressure gauge and critical orifice assembly to a Summa can.
5.2.10.3 Fill out a label with the sample ID, date, analysis needed and attach it to the Summa can.
5.2.10.4 Disconnect the top sample tubing from the small S.S. valve and connect it to the Summa can.
5.2.10.5 Tighten compression nut on critical orifice assembly snug to tubing.
5.2.10.5.1 Do not over tighten as this can damage the orifice assembly.
5.2.10.6 Turn brass valve back to "sample" and open Summa can.
5.2.10.6.1 Open Summa can valve until there's no resistance, then tighten to the point that resistance is felt.
5.2.10.7 You are now collecting sample.
5.2.10.8 Note the pressure reading on the Summa cans gauge and the start time, log these on the field sheet and also the label on the Summa can.
5.2.10.9 The Summa can will take approximately 40 to 90 minutes to fill.
5.2.10.9.1 This time is dependant on soil restrictions and flow.

5.2.10.10 While sample is being collected log the Summa can and critical orifice assemblies ID numbers on the Chain of Custody.
5.2.10.10.1 Summa can numbers should look like " SC000001" critical orifice numbers will look like " OA000001".
5.2.10.11 Monitor the gauge on the Summa can.
5.2.10.11.1 When the vacuum pressure is at 4 inches of mercury or less close the valve on the can.
5.2.10.12 Log the final pressure and stop time on the label, the field log sheet and the Chain of Custody.
5.2.10.13 Make sure the valve on the can is closed!
5.2.10.13.1 Disconnect the gauge and orifice assembly from the can.
5.2.10.13.2 Place cap back on can and tighten.
5.2.10.14 Make sure to keep the used gauges and orifice assemblies separate from the unused ones to prevent any cross-contamination.

6.0 QUALITY CONTROL

6.1 Quality control procedures are outlined in EAI QA/QC Manual. In addition the QA/QC requirements outlined in NHDES Soil Vapor Intrusion Guidance document are incorporated via reference.
6.2 Teflon tubing can be substituted for polyethylene tubing depending on the project scope or upon client request.
6.3 Document unusual situations in the field log.

7.0 CORRECTIVE ACTIONS

7.1 The corrective actions outlined in the referenced NHDES Soil Vapor Intrusion Guidance document are followed.
7.2 The corrective actions outlined in the referenced EAI QA/QC Manual are followed.

8.0 SAFETY, POLLUTION PREVENTION AND WASTE MANAGEMENT

8.1 The safety procedures outlined in the EAI Safety Manual are followed.
8.2 Tubing used during sample collection is never reused and is properly discarded

9.0 REFERENCES

9.1 EAI QA/QC Manual 2010
9.2 NHDES Soil Vapor Intrusion Guidance document
9.3 EAI Safety Manual
9.4 NELAC Standards 2003

SUB-SLAB SOIL GAS SAMPLING

1.0 SCOPE AND APPLICATION

Sub-Slab sampling is conducted to determine the concentrations of volatile organic compounds (VOCs) in soil gas underlying a structure with slab flooring. The results of the sub-slab sampling can be used to determine the potential for vapor intrusion into the overlying structure. This standard operating procedure (SOP) outlines the methods used for the sampling of subsurface soil gases beneath slabs.

There are standard (i.e., typically applicable) operating procedures which may be varied or changed as required, dependent on site conditions, equipment limitations imposed by the procedure. In all instances, the procedures ultimately employed should be documented and associated with the final report.

Mention of trade names or commercial products does not constitute United States Environmental Protection Agency) U.S. EPA endorsement or recommendation for use.

2.0 SUMMARY OF METHOD

Sub-slab soil gas is sampled by drilling a hole into the slab and inserting Teflon® tubing which is attached to a vacuum pump. The pump is then used to collect the soil gas sample into a canister for a specified period of time (as documented in the Field Sampling Plan).

3.0 SAMPLE PRESERVATION, CONTAINERS, HANDLING, AND STORAGE

Canisters such as SUMMA® canisters are typically used for soil gas sampling and are certified clean by GC/MS analysis before being utilized in the field. After sampling is completed, the samples can be analyzed in the field laboratory, or are stored and shipped in travel cases for off-site laboratory analysis. Most VOCs can be recovered from canisters with minimal loss up to 30 days.

4.0 INTERFERENCES

A number of factors specific to soil gas can affect the response of a photo ionization detector (PID). Rapid temperature fluctuations will cause the PID lamp to fog; high humidity can also cause lamp fogging and decreased sensitivity. High concentrations of methane can cause a downscale deflection of the meter. High and low temperature, electrical fields, FM radio transmission, and naturally occurring compounds will affect instrument response.

A number of factors to soil gas can also affect the response of a flame ionization detector (FID). High humidity can cause the FID to flame out or not ignite at all. The FID can only read organic based compounds (they must contain carbon in the molecular structure). The FID also responds poorly to hydrocarbons and halogenated hydrocarbons

(such as gasoline, propane fuel). High and low temperature, electrical fields and FM radio transmission will also affect instrument response.

In general, concentrations of organic compounds in soil gas can be affected by the physical and chemical characteristics of the soil, soil moisture, and nature of the target compound. Important factors to consider include the contaminant's vapor pressure, solubility, and density. Organic molecules can be tightly adsorbed to the surface of chemically active soil particles, such as clays, thus reducing the concentration in the soil interstitial spaces. Similarly, some organic compounds can be dissolved in the soil water or associated with soil organic components.

5.0 EQUIPMENT/APPARATUS

Equipment used for monitoring air conditions must be properly calibrated and tested prior to use. All equipment must be calibrated in accordance with the manufacture's specifications in a clean area on site. Instrument calibration schedules, as well as any deviations in performance criteria, must be recorded in the field logbook.

Equipment for the collection of the soil-gas beneath the slab include the following:

- Rotary hammer drill with smaller (e.g. ¼") and larger (e.g. ¾") bits
- Teflon® tubing
- Quick-drying Portland cement (no additives)
- Canisters w/appropriately sized stainless steel fittings and graphite seals
- Computer dusting gas (to test integrity of seal/infiltration of air from the surface)
- PID/FID or other field air monitoring device
- Vacuum or sampling system (syringe, peristaltic pump)
- Vacuum gauges
- Sample Documentation (soil gas labels, field data sheets, logbook, etc.)
- Direct-push sampling assembly (may be used in place of hammer drill if access allows)

6.0 DOCUMENTATION AND RECORDS

A permanent record must be maintained in a field logbook for each sub-slab soil gas sample collected. This record should include, but may not be limited to, the following items.

- Time and date of sampling activity
- Weather conditions
- Personnel performing the sampling
- Record of utility clearance
- Sample identification number(s) and location(s) (GPS or surveyed if possible)
- Thickness of concrete slab
- Depths of soil gas samples

- Manufacturer, lot numbers, clean certifications from Teflon® tubing provided by drillers
- Clean certificates for canisters
- Any problems encountered during slab drilling

7.0 PROCEDURE

Prior to sampling:

1. If possible determine the thickness of the slab from the facility/property owner.

2. Select location, preferably free of visible contamination and distant from solvent use. Record initial PID readings in ambient air.

3. Locate and mark all potential sampling locations. (Do not use any type of paint for marking)

4. Arrange and complete all necessary utility clearances.

5. Decontaminate all equipment associated with sample collection (e.g., rods, tips, barbs, etc.).

6. Prepare sampling locations for equipment access. Clear area using broom to provide clean surface.

7. Calibrate the PID and ensure all canisters are calibrated by supplier.

8. Don appropriate personal protective equipment required by the site-specific health and safety plan.

Sampling Procedure:

1. For 4" concrete slabs, drill a ¾" to 1" diameter hole into the slab to a depth of approximately 2". If the slab is thicker than 4" the ¾" to 1" diameter the hole can be extended to 2" above the base of the slab.

2. Clear debris from the hole using a new brush.

3. Drill a smaller (e.g. ¼") diameter hole from the base of the ¾" to 1" hole through the slab, extending an inch or two below the base of the slab. The size of the smaller hole is dependent on the size of the tubing used to collect the sample.

4. If obstruction such as rebar is encountered, move the sample location 2" to 3" from the original location.

5. Clear remaining debris from hole using a new brush.

6. Insert new dedicated tubing to the base of the slab, taking care not to locate the base of the tubing atop the fill below the slab (i.e., allow an air gap at the base of the hole to prevent the introduction of debris into the sample).

7. Install and hydrate quick-drying Portland cement (no additives) in the annular space of the ¾" to 1" hole, allow to dry according to manufactures instructions (typically 15-20 minutes).

8. Attach decontaminated barb of manual vacuum pump to exposed tubing end and apply a vacuum after recording start time. Observe the vacuum reading and record the time at which atmospheric pressure is reached. If vacuum is retained after a period of five minutes, record the reduction in vacuum from the initial reading, if any, and disconnect the vacuum pump.

9. Immediately following vacuum pump disconnection, attach the exposed tubing end to the sample collection assembly, tightening the compression fitting no more than 1/8 turn past finger tight. Open the sample collection valve, recording the sample collection start time and initial canister vacuum.

10. Collect sub-slab soil gas sample over the period of time specified in the field sampling plan, taking care not to allow the canister to reach atmospheric pressure. Record ambient air PID readings every 15 minutes. Close the sample collection valve, record the sample collection end time and canister vacuum.

11. Disassemble sample collection equipment, remove sample collection tubing (or cut below surface if unable to remove) and fill any remaining voids in the slab surface with quick drying cement.

8.0 QUALITY ASSURANCE/QUALITY CONTROL

Based on the requirements of the Field Sampling Plan, QC samples may need to be collected. This may include Ambient Air and Equipment Blank samples. These QC samples should be collected from an upwind portion of the facility, preferably during the collection of a soil gas sample. Record ambient air PID readings at 5-minute intervals.

Place two canisters equipped with regulators (timeframe of collection specified in the field sampling plan) on ground surface in an upwind location. For the Ambient Air sample, attach the regulator directly to the canister and open the valve. For the Equipment Blank, attach a length of tubing (approximately the same length as that to be used during subsurface soil gas sample collection, tightened only 1/8 turn past finger tight) and direct push sample collection fitting representative of that used for soil gas sample collection to the other canister/regulator. The intake portion of the canister only (Ambient Air) and Equipment Blank assembly should be located as close to one another as is possible.

Open both sample collection valves simultaneously. Record valve opening time and initial vacuum for each canister. Collect samples for the time specified in the field sampling plan. Close valves on both canisters simultaneously, taking care not to allow the canister to reach atmospheric pressure. Record the sample collection end time and canister vacuum for each canister.

If a duplicate sample is required, drill a second hole through the slab approximately 6" from the proposed sampling location. Follow all the procedures described in Section 7.0 above. After setting up the sampling systems, ensure that both sample collection valves are opened simultaneously.

If Freon-type compounds are not of concern, the following procedure may be used to determine if leakage is occurring through the seal in the sampling hole (through the concrete slab) or through the canister/regulator connection (i.e. threads). Dispense several seconds worth of "Dust-off" or similar Freon-type dusting gas in the vicinity of the installed subsurface soil gas collection system every 15 to 30 minutes of sample collection, recording the time of each event in your logs. If leakage is occurring through the sampling hole or canister/regulator connection, this will result in high concentrations of Freon-type compounds in the sample which will not interfere with detection of target compounds. When selecting the Freon-type dusting gas, ensure that the material does not contain chlorofluorocarbons (CFCs). Also, note that this procedure is NOT to be performed during the collection of Ambient Air and Equipment Blank Samples.

9.0 NOTES

Use manual vacuum pump at each and every soil gas sample location to purge tubing prior to sample collection. Complete no more than 10 pump cycles. Record information as specified under the sub-slab sampling procedure, Step 7, above. Record ambient air PID readings at 15-minute intervals during subsurface soil gas sampling.

10.0 HEALTH AND SAFETY

All field personnel should be trained in accordance with OSHA and EPA requirements, and should be provided with appropriate personal protective clothing and safety equipment. Personnel are required to inspect their PPE prior to entering any job site and replace any damaged items.

11.0 REFERENCES

U.S Environmental Protection Agency, Principal Investigator: DiGiulio, Dominic, Development of a Sub-Slab Gas Sampling Protocol to Support Assessment of Vapor Intrusion.

Geoprobe Systems, Soil Gas Sampling- PRT System Operation.

Appendix B

Site Photos

Soil Gas Point SG-2 Location

Soil Gas Point SG-3 Location

Soil Gas Point SG-4 Location

Soil Gas Sampling at Soil Gas Point SG-3 Location

Soil Gas Sampling at Soil Gas Point SG-1 Location

“Outdoor Control” Sampling Location (Location Inside Fenced Area)

Appendix C

Field Log Book Notes

02/25/15 Leave RIC 0450

Cummings Center
181 Eliott Street
Beverly, MA
Arrive: 0630

Soil vapor sampling point installations

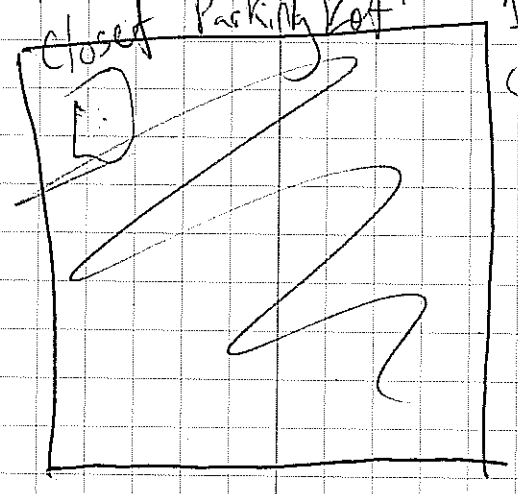
SG-1: ~~located in SW closet. Concrete ~ 18" (length of bit)~~ Located in hallway next to closet

SG-2: Concrete ~ 1ft thick. Vapor sampling point installed

SG-3: located in NE-most room (room w/ a bed and window, to the right of the exit stairs). Concrete ~ 1ft thick w/ soil similar to SG-2.

SG-4: Roughly the same thickness of concrete as SG-2 + SG-3. Soil was black, moist. Vapor point installed just below the concrete.

~~Two (2)~~ attempts were made to Three (3) install sample point SG-1. ~~On~~ This attempt (successful) installed in hallway w/ closet in the corner



Depart site @ 1030

181 Eliot St
Beverly, MA
Arrive: 0555

Soil gas sampling
SG-2: 1-min of purging

~~Readings~~ PID (ppm)
~~Ambient 24.1~~
=
Highest 26.4
@point

SG-3
Ambient 17.6
Highest 13.2
point reading

SG-1
Ambient 10.4
Reading @point 17.0

SG-4
Ambient 10.9
Reading @point 2.0
-1.88
stop 8:03pm
Depart site @ 0812pm

Appendix D

Laboratory Analysis Report

ANALYTICAL REPORT

Lab Number:	L1504425
Client:	FSL Associates 358 Chesnut Hill Ave. Brighton, MA 02135
ATTN:	Bruce Hoskins
Phone:	(617) 232-0001
Project Name:	CUMMINGS BEVERLY
Project Number:	CUMMINGS BEVERLY
Report Date:	03/25/15

Certifications & Approvals: NY (11627), CT (PH-0141), NH (2206), NJ NELAP (MA015), RI (LAO00299), ME (MA00030), PA (68-02089), VA (460194), LA NELAP (03090), FL (E87814), TX (T104704419), WA (C954), USFWS (Permit #LE2069641), USDA (Permit #P330-11-00109), US Army Corps of Engineers.

320 Forbes Boulevard, Mansfield, MA 02048-1806
508-822-9300 (Fax) 508-822-3288 800-624-9220 - www.alphalab.com

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1504425-01	OUTDOOR CONTROL	AIR	181 ELLIOT STREET	03/08/15 13:31	03/10/15
L1504425-02	S-157-J.1	AIR	181 ELLIOT STREET	03/08/15 13:23	03/10/15
L1504425-03	S-157-J.2	AIR	181 ELLIOT STREET	03/08/15 13:22	03/10/15
L1504425-04	S-157-J	AIR	181 ELLIOT STREET	03/08/15 13:24	03/10/15
L1504425-05	DUPLICATE	AIR	181 ELLIOT STREET	03/08/15 13:24	03/10/15
L1504425-06	BLANK	AIR	181 ELLIOT STREET	03/06/15 00:00	03/10/15
L1504425-07	SG-1	SOIL_VAPOR	181 ELLIOT STREET	03/06/15 19:43	03/10/15
L1504425-08	SG-2	SOIL_VAPOR	181 ELLIOT STREET	03/06/15 18:51	03/10/15
L1504425-09	SG-3	SOIL_VAPOR	181 ELLIOT STREET	03/06/15 19:31	03/10/15
L1504425-10	SG-4	SOIL_VAPOR	181 ELLIOT STREET	03/06/15 20:02	03/10/15
L1504425-11	SG BLANK	SOIL_VAPOR	181 ELLIOT STREET	03/06/15 00:00	03/10/15

Project Name:	CUMMINGS BEVERLY	**Lab Number:**	L1504425
Project Number:	CUMMINGS BEVERLY	**Report Date:**	03/25/15

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	YES
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	YES
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	NO
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	YES
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	YES

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet all of the requirements of NELAC, for all NELAC accredited parameters. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY
For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name:	CUMMINGS BEVERLY	**Lab Number:**	L1504425
Project Number:	CUMMINGS BEVERLY	**Report Date:**	03/25/15

Case Narrative (continued)

REISSUE

Report Submission

This report replaces the report previously issued on March 17, 2015. This report has been reissued to report 1,1,1,2-Tetrachloroethane.

Volatile Organics in Air

Canisters were released from the laboratory on February 24, 2015. The canister certification results are provided as an addendum.

Report Submission

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

Samples L1504425-07 through -09 and Laboratory WG767577-5 Duplicate: The presence of Isopropyl Alcohol could not be determined in these samples due to a non-target compound interfering with the identification and quantification of this compound.

Sample L1504425-10 results for Acetone should be considered estimated due to co-elution with a non-target peak.

MCP Related Narratives

Petroleum Hydrocarbons in Air

In reference to question G:

One or more of the target analytes did not achieve the requested CAM reporting limits.

Samples L1504425-01 through -11: All significant concentrations of non-petroleum VOCs detected in the TO-15 analysis were subtracted from the corresponding hydrocarbon ranges.

Project Name:	CUMMINGS BEVERLY	**Lab Number:**	L1504425
Project Number:	CUMMINGS BEVERLY	**Report Date:**	03/25/15

Case Narrative (continued)

SamplesL1504425-02, -03, -04, -05, -08, -09, and -10: Unknown siloxanes are present in the C5-C8 Aliphatic Hydrocarbon range. The response for these analytes was not included in the calculation of the C5-C8 range result since they are not petroleum hydrocarbons.

Samples L1504425-02, -03, -04, -05, -08, -09, and -10: Unknown siloxanes are present in the C9-C12 Aliphatic Hydrocarbon range. The response for these analytes was not included in the calculation of the C9-C12 range result since they are not petroleum hydrocarbons.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Christopher J. Anderson

Title: Technical Director/Representative Date: 03/25/15

AIR

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-01
Client ID: OUTDOOR CONTROL
Sample Location: 181 ELLIOT STREET
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 03/11/15 20:51
Analyst: RY

Date Collected: 03/08/15 13:31
Date Received: 03/10/15
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Propylene	0.286	0.500	0.093	0.492	0.861	0.160	J	1
Ethanol	2.96	2.50	0.542	5.58	4.71	1.02		1
Vinyl bromide	ND	0.200	0.070	ND	0.874	0.306		1
Acetone	2.34	1.00	0.269	5.56	2.38	0.639		1
Isopropanol	ND	0.500	0.114	ND	1.23	0.280		1
3-Chloropropene	ND	0.200	0.081	ND	0.626	0.254		1
Carbon disulfide	ND	0.200	0.035	ND	0.623	0.107		1
Vinyl acetate	ND	0.200	0.057	ND	0.704	0.200		1
2-Butanone	0.147	0.500	0.052	0.434	1.47	0.154	J	1
Ethyl Acetate	ND	0.500	0.131	ND	1.80	0.472		1
Tetrahydrofuran	ND	0.500	0.062	ND	1.47	0.183		1
n-Hexane	0.071	0.200	0.052	0.250	0.705	0.183	J	1
Cyclohexane	ND	0.200	0.066	ND	0.688	0.226		1
1,4-Dioxane	ND	0.200	0.078	ND	0.721	0.281		1
2,2,4-Trimethylpentane	ND	0.200	0.066	ND	0.934	0.308		1
Heptane	ND	0.200	0.055	ND	0.820	0.227		1
4-Methyl-2-pentanone	ND	0.500	0.061	ND	2.05	0.249		1
2-Hexanone	ND	0.200	0.060	ND	0.820	0.248		1
4-Ethyltoluene	ND	0.200	0.078	ND	0.983	0.381		1
Benzyl chloride	ND	0.200	0.065	ND	1.04	0.334		1

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-01
Client ID: OUTDOOR CONTROL
Sample Location: 181 ELLIOT STREET

Date Collected: 03/08/15 13:31
Date Received: 03/10/15
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	83		60-140
Bromochloromethane	84		60-140
chlorobenzene-d5	85		60-140

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-01
Client ID: OUTDOOR CONTROL
Sample Location: 181 ELLIOT STREET
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 03/11/15 20:51
Analyst: RY

Date Collected: 03/08/15 13:31
Date Received: 03/10/15
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air by SIM - Mansfield Lab								
Dichlorodifluoromethane	0.384	0.200	0.006	1.90	0.989	0.030		1
Chloromethane	0.530	0.200	0.048	1.09	0.413	0.099		1
Freon-114	0.014	0.050	0.005	0.098	0.349	0.035	J	1
Vinyl chloride	ND	0.020	0.007	ND	0.051	0.018		1
1,3-Butadiene	0.017	0.020	0.006	0.038	0.044	0.013	J	1
Bromomethane	ND	0.020	0.008	ND	0.078	0.031		1
Chloroethane	ND	0.020	0.007	ND	0.053	0.019		1
Trichlorofluoromethane	0.211	0.050	0.008	1.19	0.281	0.045		1
1,1-Dichloroethene	ND	0.020	0.007	ND	0.079	0.028		1
Methylene chloride	ND	0.500	0.250	ND	1.74	0.869		1
Freon-113	0.069	0.050	0.006	0.529	0.383	0.046		1
trans-1,2-Dichloroethene	ND	0.020	0.006	ND	0.079	0.024		1
1,1-Dichloroethane	ND	0.020	0.007	ND	0.081	0.028		1
Methyl tert butyl ether	ND	0.020	0.004	ND	0.072	0.014		1
cis-1,2-Dichloroethene	ND	0.020	0.007	ND	0.079	0.026		1
Chloroform	0.015	0.020	0.006	0.073	0.098	0.029	J	1
1,2-Dichloroethane	0.015	0.020	0.008	0.061	0.081	0.032	J	1
1,1,1-Trichloroethane	ND	0.020	0.007	ND	0.109	0.038		1
Benzene	0.220	0.100	0.021	0.703	0.319	0.067		1
Carbon tetrachloride	0.069	0.020	0.008	0.434	0.126	0.050		1
1,2-Dichloropropane	ND	0.020	0.006	ND	0.092	0.028		1
Bromodichloromethane	ND	0.020	0.008	ND	0.134	0.054		1
Trichloroethene	ND	0.020	0.007	ND	0.107	0.038		1
cis-1,3-Dichloropropene	ND	0.020	0.008	ND	0.091	0.036		1

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-01
Client ID: OUTDOOR CONTROL
Sample Location: 181 ELLIOT STREET

Date Collected: 03/08/15 13:31
Date Received: 03/10/15
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	Results	RL	MDL	Results	RL	MDL	Qualifier	Dilution Factor
Volatile Organics in Air by SIM - Mansfield Lab								
trans-1,3-Dichloropropene	ND	0.020	0.008	ND	0.091	0.036		1
1,1,2-Trichloroethane	ND	0.020	0.009	ND	0.109	0.049		1
Toluene	0.181	0.050	0.025	0.682	0.188	0.094		1
Dibromochloromethane	ND	0.020	0.008	ND	0.170	0.068		1
1,2-Dibromoethane	ND	0.020	0.008	ND	0.154	0.062		1
Tetrachloroethene	0.012	0.020	0.008	0.081	0.136	0.054	J	1
1,1,1,2-Tetrachloroethane	ND	0.020	0.004	ND	0.137	0.028		1
Chlorobenzene	ND	0.020	0.008	ND	0.092	0.037		1
Ethylbenzene	0.028	0.020	0.007	0.122	0.087	0.030		1
p/m-Xylene	0.072	0.040	0.009	0.313	0.174	0.039		1
Bromoform	ND	0.020	0.015	ND	0.207	0.155		1
Styrene	ND	0.020	0.008	ND	0.085	0.034		1
1,1,2,2-Tetrachloroethane	ND	0.020	0.007	ND	0.137	0.048		1
o-Xylene	0.027	0.020	0.008	0.117	0.087	0.035		1
1,3,5-Trimethybenzene	0.005	0.020	0.005	0.025	0.098	0.025	J	1
1,2,4-Trimethylbenzene	0.017	0.020	0.007	0.084	0.098	0.034	J	1
1,3-Dichlorobenzene	ND	0.020	0.007	ND	0.120	0.042		1
1,4-Dichlorobenzene	ND	0.020	0.008	ND	0.120	0.048		1
1,2-Dichlorobenzene	ND	0.020	0.007	ND	0.120	0.042		1
1,2,4-Trichlorobenzene	ND	0.050	0.010	ND	0.371	0.074		1
Naphthalene	ND	0.050	0.012	ND	0.262	0.063		1
Hexachlorobutadiene	ND	0.050	0.011	ND	0.533	0.117		1

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-difluorobenzene	84		60-140
bromochloromethane	85		60-140
chlorobenzene-d5	89		60-140

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-02
Client ID: S-157-J.1
Sample Location: 181 ELLIOT STREET
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 03/11/15 21:23
Analyst: RY

Date Collected: 03/08/15 13:23
Date Received: 03/10/15
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Propylene	0.233	0.500	0.093	0.401	0.861	0.160	J	1
Ethanol	37.2	2.50	0.542	70.1	4.71	1.02		1
Vinyl bromide	ND	0.200	0.070	ND	0.874	0.306		1
Acetone	10.6	1.00	0.269	25.2	2.38	0.639		1
Isopropanol	30.6	0.500	0.114	75.2	1.23	0.280		1
3-Chloropropene	ND	0.200	0.081	ND	0.626	0.254		1
Carbon disulfide	ND	0.200	0.035	ND	0.623	0.107		1
Vinyl acetate	ND	0.200	0.057	ND	0.704	0.200		1
2-Butanone	0.380	0.500	0.052	1.12	1.47	0.154	J	1
Ethyl Acetate	ND	0.500	0.131	ND	1.80	0.472		1
Tetrahydrofuran	ND	0.500	0.062	ND	1.47	0.183		1
n-Hexane	0.130	0.200	0.052	0.458	0.705	0.183	J	1
Cyclohexane	0.240	0.200	0.066	0.826	0.688	0.226		1
1,4-Dioxane	ND	0.200	0.078	ND	0.721	0.281		1
2,2,4-Trimethylpentane	ND	0.200	0.066	ND	0.934	0.308		1
Heptane	0.110	0.200	0.055	0.451	0.820	0.227	J	1
4-Methyl-2-pentanone	ND	0.500	0.061	ND	2.05	0.249		1
2-Hexanone	ND	0.200	0.060	ND	0.820	0.248		1
4-Ethyltoluene	0.763	0.200	0.078	3.75	0.983	0.381		1
Benzyl chloride	ND	0.200	0.065	ND	1.04	0.334		1

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-02
Client ID: S-157-J.1
Sample Location: 181 ELLIOT STREET

Date Collected: 03/08/15 13:23
Date Received: 03/10/15
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	85		60-140
Bromochloromethane	89		60-140
chlorobenzene-d5	90		60-140

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-02
Client ID: S-157-J.1
Sample Location: 181 ELLIOT STREET
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 03/11/15 21:23
Analyst: RY

Date Collected: 03/08/15 13:23
Date Received: 03/10/15
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air by SIM - Mansfield Lab								
Dichlorodifluoromethane	0.327	0.200	0.006	1.62	0.989	0.030		1
Chloromethane	0.517	0.200	0.048	1.07	0.413	0.099		1
Freon-114	0.013	0.050	0.005	0.091	0.349	0.035	J	1
Vinyl chloride	ND	0.020	0.007	ND	0.051	0.018		1
1,3-Butadiene	0.029	0.020	0.006	0.064	0.044	0.013		1
Bromomethane	ND	0.020	0.008	ND	0.078	0.031		1
Chloroethane	ND	0.020	0.007	ND	0.053	0.019		1
Trichlorofluoromethane	0.206	0.050	0.008	1.16	0.281	0.045		1
1,1-Dichloroethene	ND	0.020	0.007	ND	0.079	0.028		1
Methylene chloride	0.598	0.500	0.250	2.08	1.74	0.869		1
Freon-113	0.066	0.050	0.006	0.506	0.383	0.046		1
trans-1,2-Dichloroethene	ND	0.020	0.006	ND	0.079	0.024		1
1,1-Dichloroethane	ND	0.020	0.007	ND	0.081	0.028		1
Methyl tert butyl ether	ND	0.020	0.004	ND	0.072	0.014		1
cis-1,2-Dichloroethene	0.026	0.020	0.007	0.103	0.079	0.026		1
Chloroform	0.021	0.020	0.006	0.103	0.098	0.029		1
1,2-Dichloroethane	0.016	0.020	0.008	0.065	0.081	0.032	J	1
1,1,1-Trichloroethane	0.007	0.020	0.007	0.038	0.109	0.038	J	1
Benzene	0.255	0.100	0.021	0.815	0.319	0.067		1
Carbon tetrachloride	0.069	0.020	0.008	0.434	0.126	0.050		1
1,2-Dichloropropane	0.009	0.020	0.006	0.042	0.092	0.028	J	1
Bromodichloromethane	ND	0.020	0.008	ND	0.134	0.054		1
Trichloroethene	0.013	0.020	0.007	0.070	0.107	0.038	J	1
cis-1,3-Dichloropropene	ND	0.020	0.008	ND	0.091	0.036		1

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-02
Client ID: S-157-J.1
Sample Location: 181 ELLIOT STREET

Date Collected: 03/08/15 13:23
Date Received: 03/10/15
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air by SIM - Mansfield Lab								
trans-1,3-Dichloropropene	ND	0.020	0.008	ND	0.091	0.036		1
1,1,2-Trichloroethane	ND	0.020	0.009	ND	0.109	0.049		1
Toluene	0.597	0.050	0.025	2.25	0.188	0.094		1
Dibromochloromethane	ND	0.020	0.008	ND	0.170	0.068		1
1,2-Dibromoethane	ND	0.020	0.008	ND	0.154	0.062		1
Tetrachloroethene	0.020	0.020	0.008	0.136	0.136	0.054		1
1,1,1,2-Tetrachloroethane	ND	0.020	0.004	ND	0.137	0.028		1
Chlorobenzene	ND	0.020	0.008	ND	0.092	0.037		1
Ethylbenzene	0.105	0.020	0.007	0.456	0.087	0.030		1
p/m-Xylene	0.316	0.040	0.009	1.37	0.174	0.039		1
Bromoform	ND	0.020	0.015	ND	0.207	0.155		1
Styrene	0.031	0.020	0.008	0.132	0.085	0.034		1
1,1,2,2-Tetrachloroethane	ND	0.020	0.007	ND	0.137	0.048		1
o-Xylene	0.173	0.020	0.008	0.751	0.087	0.035		1
1,3,5-Trimethybenzene	0.761	0.020	0.005	3.74	0.098	0.025		1
1,2,4-Trimethylbenzene	3.07	0.020	0.007	15.1	0.098	0.034		1
1,3-Dichlorobenzene	ND	0.020	0.007	ND	0.120	0.042		1
1,4-Dichlorobenzene	ND	0.020	0.008	ND	0.120	0.048		1
1,2-Dichlorobenzene	ND	0.020	0.007	ND	0.120	0.042		1
1,2,4-Trichlorobenzene	ND	0.050	0.010	ND	0.371	0.074		1
Naphthalene	0.035	0.050	0.012	0.184	0.262	0.063	J	1
Hexachlorobutadiene	ND	0.050	0.011	ND	0.533	0.117		1

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-difluorobenzene	84		60-140
bromochloromethane	89		60-140
chlorobenzene-d5	92		60-140

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-03
Client ID: S-157-J.2
Sample Location: 181 ELLIOT STREET
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 03/11/15 21:55
Analyst: RY

Date Collected: 03/08/15 13:22
Date Received: 03/10/15
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Propylene	0.310	0.500	0.093	0.534	0.861	0.160	J	1
Ethanol	38.7	2.50	0.542	72.9	4.71	1.02		1
Vinyl bromide	ND	0.200	0.070	ND	0.874	0.306		1
Acetone	11.8	1.00	0.269	28.0	2.38	0.639		1
Isopropanol	33.4	0.500	0.114	82.1	1.23	0.280		1
3-Chloropropene	ND	0.200	0.081	ND	0.626	0.254		1
Carbon disulfide	ND	0.200	0.035	ND	0.623	0.107		1
Vinyl acetate	ND	0.200	0.057	ND	0.704	0.200		1
2-Butanone	0.419	0.500	0.052	1.24	1.47	0.154	J	1
Ethyl Acetate	ND	0.500	0.131	ND	1.80	0.472		1
Tetrahydrofuran	ND	0.500	0.062	ND	1.47	0.183		1
n-Hexane	0.137	0.200	0.052	0.483	0.705	0.183	J	1
Cyclohexane	0.110	0.200	0.066	0.379	0.688	0.226	J	1
1,4-Dioxane	ND	0.200	0.078	ND	0.721	0.281		1
2,2,4-Trimethylpentane	ND	0.200	0.066	ND	0.934	0.308		1
Heptane	0.147	0.200	0.055	0.602	0.820	0.227	J	1
4-Methyl-2-pentanone	ND	0.500	0.061	ND	2.05	0.249		1
2-Hexanone	ND	0.200	0.060	ND	0.820	0.248		1
4-Ethyltoluene	0.709	0.200	0.078	3.49	0.983	0.381		1
Benzyl chloride	ND	0.200	0.065	ND	1.04	0.334		1

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-03
Client ID: S-157-J.2
Sample Location: 181 ELLIOT STREET

Date Collected: 03/08/15 13:22
Date Received: 03/10/15
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	82		60-140
Bromochloromethane	85		60-140
chlorobenzene-d5	94		60-140

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-03
Client ID: S-157-J.2
Sample Location: 181 ELLIOT STREET
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 03/11/15 21:55
Analyst: RY

Date Collected: 03/08/15 13:22
Date Received: 03/10/15
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air by SIM - Mansfield Lab								
Dichlorodifluoromethane	0.372	0.200	0.006	1.84	0.989	0.030		1
Chloromethane	0.543	0.200	0.048	1.12	0.413	0.099		1
Freon-114	0.014	0.050	0.005	0.098	0.349	0.035	J	1
Vinyl chloride	ND	0.020	0.007	ND	0.051	0.018		1
1,3-Butadiene	0.032	0.020	0.006	0.071	0.044	0.013		1
Bromomethane	ND	0.020	0.008	ND	0.078	0.031		1
Chloroethane	ND	0.020	0.007	ND	0.053	0.019		1
Trichlorofluoromethane	0.213	0.050	0.008	1.20	0.281	0.045		1
1,1-Dichloroethene	ND	0.020	0.007	ND	0.079	0.028		1
Methylene chloride	0.622	0.500	0.250	2.16	1.74	0.869		1
Freon-113	0.069	0.050	0.006	0.529	0.383	0.046		1
trans-1,2-Dichloroethene	0.006	0.020	0.006	0.024	0.079	0.024	J	1
1,1-Dichloroethane	ND	0.020	0.007	ND	0.081	0.028		1
Methyl tert butyl ether	ND	0.020	0.004	ND	0.072	0.014		1
cis-1,2-Dichloroethene	0.027	0.020	0.007	0.107	0.079	0.026		1
Chloroform	0.022	0.020	0.006	0.107	0.098	0.029		1
1,2-Dichloroethane	0.019	0.020	0.008	0.077	0.081	0.032	J	1
1,1,1-Trichloroethane	ND	0.020	0.007	ND	0.109	0.038		1
Benzene	0.281	0.100	0.021	0.898	0.319	0.067		1
Carbon tetrachloride	0.070	0.020	0.008	0.440	0.126	0.050		1
1,2-Dichloropropane	ND	0.020	0.006	ND	0.092	0.028		1
Bromodichloromethane	ND	0.020	0.008	ND	0.134	0.054		1
Trichloroethene	0.020	0.020	0.007	0.107	0.107	0.038		1
cis-1,3-Dichloropropene	ND	0.020	0.008	ND	0.091	0.036		1

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY
Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-03
Client ID: S-157-J.2
Sample Location: 181 ELLIOT STREET
Date Collected: 03/08/15 13:22
Date Received: 03/10/15
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air by SIM - Mansfield Lab								
trans-1,3-Dichloropropene	ND	0.020	0.008	ND	0.091	0.036		1
1,1,2-Trichloroethane	ND	0.020	0.009	ND	0.109	0.049		1
Toluene	0.607	0.050	0.025	2.29	0.188	0.094		1
Dibromochloromethane	ND	0.020	0.008	ND	0.170	0.068		1
1,2-Dibromoethane	ND	0.020	0.008	ND	0.154	0.062		1
Tetrachloroethene	0.023	0.020	0.008	0.156	0.136	0.054		1
1,1,1,2-Tetrachloroethane	ND	0.020	0.004	ND	0.137	0.028		1
Chlorobenzene	ND	0.020	0.008	ND	0.092	0.037		1
Ethylbenzene	0.101	0.020	0.007	0.439	0.087	0.030		1
p/m-Xylene	0.308	0.040	0.009	1.34	0.174	0.039		1
Bromoform	ND	0.020	0.015	ND	0.207	0.155		1
Styrene	0.030	0.020	0.008	0.128	0.085	0.034		1
1,1,2,2-Tetrachloroethane	ND	0.020	0.007	ND	0.137	0.048		1
o-Xylene	0.166	0.020	0.008	0.721	0.087	0.035		1
1,3,5-Trimethybenzene	0.804	0.020	0.005	3.95	0.098	0.025		1
1,2,4-Trimethylbenzene	2.97	0.020	0.007	14.6	0.098	0.034		1
1,3-Dichlorobenzene	ND	0.020	0.007	ND	0.120	0.042		1
1,4-Dichlorobenzene	ND	0.020	0.008	ND	0.120	0.048		1
1,2-Dichlorobenzene	ND	0.020	0.007	ND	0.120	0.042		1
1,2,4-Trichlorobenzene	ND	0.050	0.010	ND	0.371	0.074		1
Naphthalene	0.034	0.050	0.012	0.178	0.262	0.063	J	1
Hexachlorobutadiene	ND	0.050	0.011	ND	0.533	0.117		1

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-difluorobenzene	83		60-140
bromochloromethane	87		60-140
chlorobenzene-d5	93		60-140

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-04
Client ID: S-157-J
Sample Location: 181 ELLIOT STREET
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 03/11/15 22:27
Analyst: RY

Date Collected: 03/08/15 13:24
Date Received: 03/10/15
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Propylene	0.292	0.500	0.093	0.503	0.861	0.160	J	1
Ethanol	54.0	2.50	0.542	102	4.71	1.02		1
Vinyl bromide	ND	0.200	0.070	ND	0.874	0.306		1
Acetone	13.9	1.00	0.269	33.0	2.38	0.639		1
Isopropanol	31.9	0.500	0.114	78.4	1.23	0.280		1
3-Chloropropene	ND	0.200	0.081	ND	0.626	0.254		1
Carbon disulfide	ND	0.200	0.035	ND	0.623	0.107		1
Vinyl acetate	ND	0.200	0.057	ND	0.704	0.200		1
2-Butanone	0.532	0.500	0.052	1.57	1.47	0.154		1
Ethyl Acetate	ND	0.500	0.131	ND	1.80	0.472		1
Tetrahydrofuran	ND	0.500	0.062	ND	1.47	0.183		1
n-Hexane	0.243	0.200	0.052	0.856	0.705	0.183		1
Cyclohexane	7.26	0.200	0.066	25.0	0.688	0.226		1
1,4-Dioxane	ND	0.200	0.078	ND	0.721	0.281		1
2,2,4-Trimethylpentane	ND	0.200	0.066	ND	0.934	0.308		1
Heptane	0.112	0.200	0.055	0.459	0.820	0.227	J	1
4-Methyl-2-pentanone	ND	0.500	0.061	ND	2.05	0.249		1
2-Hexanone	ND	0.200	0.060	ND	0.820	0.248		1
4-Ethyltoluene	0.745	0.200	0.078	3.66	0.983	0.381		1
Benzyl chloride	ND	0.200	0.065	ND	1.04	0.334		1

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-04
Client ID: S-157-J
Sample Location: 181 ELLIOT STREET

Date Collected: 03/08/15 13:24
Date Received: 03/10/15
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	85		60-140
Bromochloromethane	88		60-140
chlorobenzene-d5	89		60-140

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-04
Client ID: S-157-J
Sample Location: 181 ELLIOT STREET
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 03/11/15 22:27
Analyst: RY

Date Collected: 03/08/15 13:24
Date Received: 03/10/15
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air by SIM - Mansfield Lab								
Dichlorodifluoromethane	0.354	0.200	0.006	1.75	0.989	0.030		1
Chloromethane	0.531	0.200	0.048	1.10	0.413	0.099		1
Freon-114	0.014	0.050	0.005	0.098	0.349	0.035	J	1
Vinyl chloride	ND	0.020	0.007	ND	0.051	0.018		1
1,3-Butadiene	0.026	0.020	0.006	0.058	0.044	0.013		1
Bromomethane	ND	0.020	0.008	ND	0.078	0.031		1
Chloroethane	ND	0.020	0.007	ND	0.053	0.019		1
Trichlorofluoromethane	0.214	0.050	0.008	1.20	0.281	0.045		1
1,1-Dichloroethene	ND	0.020	0.007	ND	0.079	0.028		1
Methylene chloride	4.67	0.500	0.250	16.2	1.74	0.869		1
Freon-113	0.081	0.050	0.006	0.621	0.383	0.046		1
trans-1,2-Dichloroethene	ND	0.020	0.006	ND	0.079	0.024		1
1,1-Dichloroethane	ND	0.020	0.007	ND	0.081	0.028		1
Methyl tert butyl ether	ND	0.020	0.004	ND	0.072	0.014		1
cis-1,2-Dichloroethene	0.027	0.020	0.007	0.107	0.079	0.026		1
Chloroform	0.024	0.020	0.006	0.117	0.098	0.029		1
1,2-Dichloroethane	0.019	0.020	0.008	0.077	0.081	0.032	J	1
1,1,1-Trichloroethane	ND	0.020	0.007	ND	0.109	0.038		1
Benzene	0.259	0.100	0.021	0.827	0.319	0.067		1
Carbon tetrachloride	0.069	0.020	0.008	0.434	0.126	0.050		1
1,2-Dichloropropane	ND	0.020	0.006	ND	0.092	0.028		1
Bromodichloromethane	ND	0.020	0.008	ND	0.134	0.054		1
Trichloroethene	0.008	0.020	0.007	0.043	0.107	0.038	J	1
cis-1,3-Dichloropropene	ND	0.020	0.008	ND	0.091	0.036		1

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY
Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-04
Client ID: S-157-J
Sample Location: 181 ELLIOT STREET
Date Collected: 03/08/15 13:24
Date Received: 03/10/15
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air by SIM - Mansfield Lab								
trans-1,3-Dichloropropene	ND	0.020	0.008	ND	0.091	0.036		1
1,1,2-Trichloroethane	ND	0.020	0.009	ND	0.109	0.049		1
Toluene	0.845	0.050	0.025	3.18	0.188	0.094		1
Dibromochloromethane	ND	0.020	0.008	ND	0.170	0.068		1
1,2-Dibromoethane	ND	0.020	0.008	ND	0.154	0.062		1
Tetrachloroethene	0.028	0.020	0.008	0.190	0.136	0.054		1
1,1,1,2-Tetrachloroethane	ND	0.020	0.004	ND	0.137	0.028		1
Chlorobenzene	ND	0.020	0.008	ND	0.092	0.037		1
Ethylbenzene	0.114	0.020	0.007	0.495	0.087	0.030		1
p/m-Xylene	0.353	0.040	0.009	1.53	0.174	0.039		1
Bromoform	ND	0.020	0.015	ND	0.207	0.155		1
Styrene	0.040	0.020	0.008	0.170	0.085	0.034		1
1,1,2,2-Tetrachloroethane	ND	0.020	0.007	ND	0.137	0.048		1
o-Xylene	0.181	0.020	0.008	0.786	0.087	0.035		1
1,3,5-Trimethybenzene	0.821	0.020	0.005	4.04	0.098	0.025		1
1,2,4-Trimethylbenzene	3.07	0.020	0.007	15.1	0.098	0.034		1
1,3-Dichlorobenzene	ND	0.020	0.007	ND	0.120	0.042		1
1,4-Dichlorobenzene	ND	0.020	0.008	ND	0.120	0.048		1
1,2-Dichlorobenzene	ND	0.020	0.007	ND	0.120	0.042		1
1,2,4-Trichlorobenzene	ND	0.050	0.010	ND	0.371	0.074		1
Naphthalene	0.033	0.050	0.012	0.173	0.262	0.063	J	1
Hexachlorobutadiene	ND	0.050	0.011	ND	0.533	0.117		1

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-difluorobenzene	85		60-140
bromochloromethane	89		60-140
chlorobenzene-d5	91		60-140

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY
Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-05
Client ID: DUPLICATE
Sample Location: 181 ELLIOT STREET
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 03/11/15 22:59
Analyst: RY

Date Collected: 03/08/15 13:24
Date Received: 03/10/15
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Propylene	0.302	0.500	0.093	0.520	0.861	0.160	J	1
Ethanol	44.8	2.50	0.542	84.4	4.71	1.02		1
Vinyl bromide	ND	0.200	0.070	ND	0.874	0.306		1
Acetone	13.2	1.00	0.269	31.4	2.38	0.639		1
Isopropanol	37.3	0.500	0.114	91.7	1.23	0.280		1
3-Chloropropene	ND	0.200	0.081	ND	0.626	0.254		1
Carbon disulfide	ND	0.200	0.035	ND	0.623	0.107		1
Vinyl acetate	ND	0.200	0.057	ND	0.704	0.200		1
2-Butanone	0.400	0.500	0.052	1.18	1.47	0.154	J	1
Ethyl Acetate	ND	0.500	0.131	ND	1.80	0.472		1
Tetrahydrofuran	ND	0.500	0.062	ND	1.47	0.183		1
n-Hexane	0.089	0.200	0.052	0.314	0.705	0.183	J	1
Cyclohexane	0.097	0.200	0.066	0.334	0.688	0.226	J	1
1,4-Dioxane	ND	0.200	0.078	ND	0.721	0.281		1
2,2,4-Trimethylpentane	ND	0.200	0.066	ND	0.934	0.308		1
Heptane	0.098	0.200	0.055	0.402	0.820	0.227	J	1
4-Methyl-2-pentanone	ND	0.500	0.061	ND	2.05	0.249		1
2-Hexanone	ND	0.200	0.060	ND	0.820	0.248		1
4-Ethyltoluene	0.804	0.200	0.078	3.95	0.983	0.381		1
Benzyl chloride	ND	0.200	0.065	ND	1.04	0.334		1

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-05
Client ID: DUPLICATE
Sample Location: 181 ELLIOT STREET

Date Collected: 03/08/15 13:24
Date Received: 03/10/15
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air - Mansfield Lab								

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	91		60-140
Bromochloromethane	83		60-140
chlorobenzene-d5	92		60-140

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-05
Client ID: DUPLICATE
Sample Location: 181 ELLIOT STREET
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 03/11/15 22:59
Analyst: RY

Date Collected: 03/08/15 13:24
Date Received: 03/10/15
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air by SIM - Mansfield Lab								
Dichlorodifluoromethane	0.400	0.200	0.006	1.98	0.989	0.030		1
Chloromethane	0.547	0.200	0.048	1.13	0.413	0.099		1
Freon-114	0.015	0.050	0.005	0.105	0.349	0.035	J	1
Vinyl chloride	ND	0.020	0.007	ND	0.051	0.018		1
1,3-Butadiene	0.030	0.020	0.006	0.066	0.044	0.013		1
Bromomethane	ND	0.020	0.008	ND	0.078	0.031		1
Chloroethane	0.012	0.020	0.007	0.032	0.053	0.019	J	1
Trichlorofluoromethane	0.222	0.050	0.008	1.25	0.281	0.045		1
1,1-Dichloroethene	ND	0.020	0.007	ND	0.079	0.028		1
Methylene chloride	0.784	0.500	0.250	2.72	1.74	0.869		1
Freon-113	0.076	0.050	0.006	0.583	0.383	0.046		1
trans-1,2-Dichloroethene	ND	0.020	0.006	ND	0.079	0.024		1
1,1-Dichloroethane	ND	0.020	0.007	ND	0.081	0.028		1
Methyl tert butyl ether	ND	0.020	0.004	ND	0.072	0.014		1
cis-1,2-Dichloroethene	0.033	0.020	0.007	0.131	0.079	0.026		1
Chloroform	0.025	0.020	0.006	0.122	0.098	0.029		1
1,2-Dichloroethane	0.019	0.020	0.008	0.077	0.081	0.032	J	1
1,1,1-Trichloroethane	ND	0.020	0.007	ND	0.109	0.038		1
Benzene	0.240	0.100	0.021	0.767	0.319	0.067		1
Carbon tetrachloride	0.065	0.020	0.008	0.409	0.126	0.050		1
1,2-Dichloropropane	ND	0.020	0.006	ND	0.092	0.028		1
Bromodichloromethane	ND	0.020	0.008	ND	0.134	0.054		1
Trichloroethene	0.008	0.020	0.007	0.043	0.107	0.038	J	1
cis-1,3-Dichloropropene	ND	0.020	0.008	ND	0.091	0.036		1

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY
Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-05
Client ID: DUPLICATE
Sample Location: 181 ELLIOT STREET
Date Collected: 03/08/15 13:24
Date Received: 03/10/15
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air by SIM - Mansfield Lab								
trans-1,3-Dichloropropene	ND	0.020	0.008	ND	0.091	0.036		1
1,1,2-Trichloroethane	ND	0.020	0.009	ND	0.109	0.049		1
Toluene	0.830	0.050	0.025	3.13	0.188	0.094		1
Dibromochloromethane	ND	0.020	0.008	ND	0.170	0.068		1
1,2-Dibromoethane	ND	0.020	0.008	ND	0.154	0.062		1
Tetrachloroethene	0.025	0.020	0.008	0.170	0.136	0.054		1
1,1,1,2-Tetrachloroethane	ND	0.020	0.004	ND	0.137	0.028		1
Chlorobenzene	ND	0.020	0.008	ND	0.092	0.037		1
Ethylbenzene	0.111	0.020	0.007	0.482	0.087	0.030		1
p/m-Xylene	0.333	0.040	0.009	1.45	0.174	0.039		1
Bromoform	ND	0.020	0.015	ND	0.207	0.155		1
Styrene	0.035	0.020	0.008	0.149	0.085	0.034		1
1,1,2,2-Tetrachloroethane	ND	0.020	0.007	ND	0.137	0.048		1
o-Xylene	0.186	0.020	0.008	0.808	0.087	0.035		1
1,3,5-Trimethybenzene	0.907	0.020	0.005	4.46	0.098	0.025		1
1,2,4-Trimethylbenzene	3.46	0.020	0.007	17.0	0.098	0.034		1
1,3-Dichlorobenzene	ND	0.020	0.007	ND	0.120	0.042		1
1,4-Dichlorobenzene	ND	0.020	0.008	ND	0.120	0.048		1
1,2-Dichlorobenzene	ND	0.020	0.007	ND	0.120	0.042		1
1,2,4-Trichlorobenzene	ND	0.050	0.010	ND	0.371	0.074		1
Naphthalene	0.036	0.050	0.012	0.189	0.262	0.063	J	1
Hexachlorobutadiene	ND	0.050	0.011	ND	0.533	0.117		1

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-difluorobenzene	88		60-140
bromochloromethane	85		60-140
chlorobenzene-d5	92		60-140

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-06
Client ID: BLANK
Sample Location: 181 ELLIOT STREET
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 03/11/15 19:46
Analyst: RY

Date Collected: 03/06/15 00:00
Date Received: 03/10/15
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Propylene	ND	0.500	0.093	ND	0.861	0.160		1
Ethanol	ND	2.50	0.542	ND	4.71	1.02		1
Vinyl bromide	ND	0.200	0.070	ND	0.874	0.306		1
Acetone	ND	1.00	0.269	ND	2.38	0.639		1
Isopropanol	ND	0.500	0.114	ND	1.23	0.280		1
3-Chloropropene	ND	0.200	0.081	ND	0.626	0.254		1
Carbon disulfide	ND	0.200	0.035	ND	0.623	0.107		1
Vinyl acetate	ND	0.200	0.057	ND	0.704	0.200		1
2-Butanone	ND	0.500	0.052	ND	1.47	0.154		1
Ethyl Acetate	ND	0.500	0.131	ND	1.80	0.472		1
Tetrahydrofuran	ND	0.500	0.062	ND	1.47	0.183		1
n-Hexane	ND	0.200	0.052	ND	0.705	0.183		1
Cyclohexane	ND	0.200	0.066	ND	0.688	0.226		1
1,4-Dioxane	ND	0.200	0.078	ND	0.721	0.281		1
2,2,4-Trimethylpentane	ND	0.200	0.066	ND	0.934	0.308		1
Heptane	ND	0.200	0.055	ND	0.820	0.227		1
4-Methyl-2-pentanone	ND	0.500	0.061	ND	2.05	0.249		1
2-Hexanone	ND	0.200	0.060	ND	0.820	0.248		1
4-Ethyltoluene	ND	0.200	0.078	ND	0.983	0.381		1
Benzyl chloride	ND	0.200	0.065	ND	1.04	0.334		1

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-06
Client ID: BLANK
Sample Location: 181 ELLIOT STREET

Date Collected: 03/06/15 00:00
Date Received: 03/10/15
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air - Mansfield Lab								

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	86		60-140
Bromochloromethane	90		60-140
chlorobenzene-d5	90		60-140

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-06
Client ID: BLANK
Sample Location: 181 ELLIOT STREET
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 03/11/15 19:46
Analyst: RY

Date Collected: 03/06/15 00:00
Date Received: 03/10/15
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air by SIM - Mansfield Lab								
Dichlorodifluoromethane	ND	0.200	0.006	ND	0.989	0.030		1
Chloromethane	ND	0.200	0.048	ND	0.413	0.099		1
Freon-114	ND	0.050	0.005	ND	0.349	0.035		1
Vinyl chloride	ND	0.020	0.007	ND	0.051	0.018		1
1,3-Butadiene	ND	0.020	0.006	ND	0.044	0.013		1
Bromomethane	ND	0.020	0.008	ND	0.078	0.031		1
Chloroethane	ND	0.020	0.007	ND	0.053	0.019		1
Trichlorofluoromethane	ND	0.050	0.008	ND	0.281	0.045		1
1,1-Dichloroethene	ND	0.020	0.007	ND	0.079	0.028		1
Methylene chloride	ND	0.500	0.250	ND	1.74	0.869		1
Freon-113	0.007	0.050	0.006	0.054	0.383	0.046	J	1
trans-1,2-Dichloroethene	ND	0.020	0.006	ND	0.079	0.024		1
1,1-Dichloroethane	ND	0.020	0.007	ND	0.081	0.028		1
Methyl tert butyl ether	ND	0.020	0.004	ND	0.072	0.014		1
cis-1,2-Dichloroethene	ND	0.020	0.007	ND	0.079	0.026		1
Chloroform	ND	0.020	0.006	ND	0.098	0.029		1
1,2-Dichloroethane	ND	0.020	0.008	ND	0.081	0.032		1
1,1,1-Trichloroethane	ND	0.020	0.007	ND	0.109	0.038		1
Benzene	ND	0.100	0.021	ND	0.319	0.067		1
Carbon tetrachloride	ND	0.020	0.008	ND	0.126	0.050		1
1,2-Dichloropropane	ND	0.020	0.006	ND	0.092	0.028		1
Bromodichloromethane	ND	0.020	0.008	ND	0.134	0.054		1
Trichloroethene	ND	0.020	0.007	ND	0.107	0.038		1
cis-1,3-Dichloropropene	ND	0.020	0.008	ND	0.091	0.036		1

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-06
Client ID: BLANK
Sample Location: 181 ELLIOT STREET

Date Collected: 03/06/15 00:00
Date Received: 03/10/15
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air by SIM - Mansfield Lab								
trans-1,3-Dichloropropene	ND	0.020	0.008	ND	0.091	0.036		1
1,1,2-Trichloroethane	ND	0.020	0.009	ND	0.109	0.049		1
Toluene	ND	0.050	0.025	ND	0.188	0.094		1
Dibromochloromethane	ND	0.020	0.008	ND	0.170	0.068		1
1,2-Dibromoethane	ND	0.020	0.008	ND	0.154	0.062		1
Tetrachloroethene	ND	0.020	0.008	ND	0.136	0.054		1
1,1,1,2-Tetrachloroethane	ND	0.020	0.004	ND	0.137	0.028		1
Chlorobenzene	ND	0.020	0.008	ND	0.092	0.037		1
Ethylbenzene	ND	0.020	0.007	ND	0.087	0.030		1
p/m-Xylene	ND	0.040	0.009	ND	0.174	0.039		1
Bromoform	ND	0.020	0.015	ND	0.207	0.155		1
Styrene	ND	0.020	0.008	ND	0.085	0.034		1
1,1,2,2-Tetrachloroethane	ND	0.020	0.007	ND	0.137	0.048		1
o-Xylene	ND	0.020	0.008	ND	0.087	0.035		1
1,3,5-Trimethybenzene	ND	0.020	0.005	ND	0.098	0.025		1
1,2,4-Trimethylbenzene	ND	0.020	0.007	ND	0.098	0.034		1
1,3-Dichlorobenzene	ND	0.020	0.007	ND	0.120	0.042		1
1,4-Dichlorobenzene	ND	0.020	0.008	ND	0.120	0.048		1
1,2-Dichlorobenzene	ND	0.020	0.007	ND	0.120	0.042		1
1,2,4-Trichlorobenzene	ND	0.050	0.010	ND	0.371	0.074		1
Naphthalene	ND	0.050	0.012	ND	0.262	0.063		1
Hexachlorobutadiene	ND	0.050	0.011	ND	0.533	0.117		1

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-difluorobenzene	86		60-140
bromochloromethane	91		60-140
chlorobenzene-d5	92		60-140

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-07
Client ID: SG-1
Sample Location: 181 ELLIOT STREET
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 03/11/15 23:31
Analyst: RY

Date Collected: 03/06/15 19:43
Date Received: 03/10/15
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Propylene	0.156	0.500	0.093	0.268	0.861	0.160	J	1
Ethanol	3.83	2.50	0.542	7.22	4.71	1.02		1
Vinyl bromide	ND	0.200	0.070	ND	0.874	0.306		1
Acetone	7.25	1.00	0.269	17.2	2.38	0.639		1
Isopropanol	ND	0.500	0.114	ND	1.23	0.280		1
3-Chloropropene	ND	0.200	0.081	ND	0.626	0.254		1
Carbon disulfide	0.120	0.200	0.035	0.374	0.623	0.107	J	1
Vinyl acetate	ND	0.200	0.057	ND	0.704	0.200		1
2-Butanone	0.369	0.500	0.052	1.09	1.47	0.154	J	1
Ethyl Acetate	ND	0.500	0.131	ND	1.80	0.472		1
Tetrahydrofuran	ND	0.500	0.062	ND	1.47	0.183		1
n-Hexane	ND	0.200	0.052	ND	0.705	0.183		1
Cyclohexane	ND	0.200	0.066	ND	0.688	0.226		1
1,4-Dioxane	ND	0.200	0.078	ND	0.721	0.281		1
2,2,4-Trimethylpentane	ND	0.200	0.066	ND	0.934	0.308		1
Heptane	ND	0.200	0.055	ND	0.820	0.227		1
4-Methyl-2-pentanone	ND	0.500	0.061	ND	2.05	0.249		1
2-Hexanone	ND	0.200	0.060	ND	0.820	0.248		1
4-Ethyltoluene	0.517	0.200	0.078	2.54	0.983	0.381		1
Benzyl chloride	ND	0.200	0.065	ND	1.04	0.334		1

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-07
Client ID: SG-1
Sample Location: 181 ELLIOT STREET

Date Collected: 03/06/15 19:43
Date Received: 03/10/15
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air - Mansfield Lab								

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	82		60-140
Bromochloromethane	87		60-140
chlorobenzene-d5	91		60-140

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-07
Client ID: SG-1
Sample Location: 181 ELLIOT STREET
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15-SIM
Analytical Date: 03/11/15 23:31
Analyst: RY

Date Collected: 03/06/15 19:43
Date Received: 03/10/15
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air by SIM - Mansfield Lab								
Dichlorodifluoromethane	0.336	0.200	0.006	1.66	0.989	0.030		1
Chloromethane	0.049	0.200	0.048	0.101	0.413	0.099	J	1
Freon-114	0.014	0.050	0.005	0.098	0.349	0.035	J	1
Vinyl chloride	ND	0.020	0.007	ND	0.051	0.018		1
1,3-Butadiene	ND	0.020	0.006	ND	0.044	0.013		1
Bromomethane	ND	0.020	0.008	ND	0.078	0.031		1
Chloroethane	ND	0.020	0.007	ND	0.053	0.019		1
Trichlorofluoromethane	0.216	0.050	0.008	1.21	0.281	0.045		1
1,1-Dichloroethene	ND	0.020	0.007	ND	0.079	0.028		1
Methylene chloride	ND	0.500	0.250	ND	1.74	0.869		1
Freon-113	0.068	0.050	0.006	0.521	0.383	0.046		1
trans-1,2-Dichloroethene	ND	0.020	0.006	ND	0.079	0.024		1
1,1-Dichloroethane	0.007	0.020	0.007	0.028	0.081	0.028	J	1
Methyl tert butyl ether	ND	0.020	0.004	ND	0.072	0.014		1
cis-1,2-Dichloroethene	ND	0.020	0.007	ND	0.079	0.026		1
Chloroform	0.052	0.020	0.006	0.254	0.098	0.029		1
1,2-Dichloroethane	ND	0.020	0.008	ND	0.081	0.032		1
1,1,1-Trichloroethane	0.025	0.020	0.007	0.136	0.109	0.038		1
Benzene	0.035	0.100	0.021	0.112	0.319	0.067	J	1
Carbon tetrachloride	0.061	0.020	0.008	0.384	0.126	0.050		1
1,2-Dichloropropane	ND	0.020	0.006	ND	0.092	0.028		1
Bromodichloromethane	ND	0.020	0.008	ND	0.134	0.054		1
Trichloroethene	0.126	0.020	0.007	0.677	0.107	0.038		1
cis-1,3-Dichloropropene	ND	0.020	0.008	ND	0.091	0.036		1

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY
Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-07
Client ID: SG-1
Sample Location: 181 ELLIOT STREET
Date Collected: 03/06/15 19:43
Date Received: 03/10/15
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air by SIM - Mansfield Lab								
trans-1,3-Dichloropropene	ND	0.020	0.008	ND	0.091	0.036		1
1,1,2-Trichloroethane	ND	0.020	0.009	ND	0.109	0.049		1
Toluene	0.211	0.050	0.025	0.795	0.188	0.094		1
Dibromochloromethane	ND	0.020	0.008	ND	0.170	0.068		1
1,2-Dibromoethane	ND	0.020	0.008	ND	0.154	0.062		1
Tetrachloroethene	0.307	0.020	0.008	2.08	0.136	0.054		1
1,1,1,2-Tetrachloroethane	ND	0.020	0.004	ND	0.137	0.028		1
Chlorobenzene	ND	0.020	0.008	ND	0.092	0.037		1
Ethylbenzene	0.165	0.020	0.007	0.717	0.087	0.030		1
p/m-Xylene	0.658	0.040	0.009	2.86	0.174	0.039		1
Bromoform	ND	0.020	0.015	ND	0.207	0.155		1
Styrene	0.009	0.020	0.008	0.038	0.085	0.034	J	1
1,1,2,2-Tetrachloroethane	ND	0.020	0.007	ND	0.137	0.048		1
o-Xylene	0.341	0.020	0.008	1.48	0.087	0.035		1
1,3,5-Trimethybenzene	1.60	0.020	0.005	7.87	0.098	0.025		1
1,2,4-Trimethylbenzene	3.59	0.020	0.007	17.6	0.098	0.034		1
1,3-Dichlorobenzene	ND	0.020	0.007	ND	0.120	0.042		1
1,4-Dichlorobenzene	0.044	0.020	0.008	0.265	0.120	0.048		1
1,2-Dichlorobenzene	0.032	0.020	0.007	0.192	0.120	0.042		1
1,2,4-Trichlorobenzene	0.014	0.050	0.010	0.104	0.371	0.074	J	1
Naphthalene	4.75	0.050	0.012	24.9	0.262	0.063		1
Hexachlorobutadiene	ND	0.050	0.011	ND	0.533	0.117		1

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-difluorobenzene	83		60-140
bromochloromethane	87		60-140
chlorobenzene-d5	91		60-140

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-08
Client ID: SG-2
Sample Location: 181 ELLIOT STREET
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 03/12/15 08:45
Analyst: RY

Date Collected: 03/06/15 18:51
Date Received: 03/10/15
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Propylene	0.142	0.500	0.093	0.244	0.861	0.160	J	1
Ethanol	2.72	2.50	0.542	5.13	4.71	1.02		1
Vinyl bromide	ND	0.200	0.070	ND	0.874	0.306		1
Acetone	2.96	1.00	0.269	7.03	2.38	0.639		1
Isopropanol	ND	0.500	0.114	ND	1.23	0.280		1
3-Chloropropene	ND	0.200	0.081	ND	0.626	0.254		1
Carbon disulfide	1.15	0.200	0.035	3.58	0.623	0.107		1
Vinyl acetate	ND	0.200	0.057	ND	0.704	0.200		1
2-Butanone	0.394	0.500	0.052	1.16	1.47	0.154	J	1
Ethyl Acetate	ND	0.500	0.131	ND	1.80	0.472		1
Tetrahydrofuran	ND	0.500	0.062	ND	1.47	0.183		1
n-Hexane	ND	0.200	0.052	ND	0.705	0.183		1
Cyclohexane	ND	0.200	0.066	ND	0.688	0.226		1
1,4-Dioxane	ND	0.200	0.078	ND	0.721	0.281		1
2,2,4-Trimethylpentane	ND	0.200	0.066	ND	0.934	0.308		1
Heptane	ND	0.200	0.055	ND	0.820	0.227		1
4-Methyl-2-pentanone	ND	0.500	0.061	ND	2.05	0.249		1
2-Hexanone	ND	0.200	0.060	ND	0.820	0.248		1
4-Ethyltoluene	ND	0.200	0.078	ND	0.983	0.381		1
Benzyl chloride	ND	0.200	0.065	ND	1.04	0.334		1

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-08
Client ID: SG-2
Sample Location: 181 ELLIOT STREET

Date Collected: 03/06/15 18:51
Date Received: 03/10/15
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air - Mansfield Lab								

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	84		60-140
Bromochloromethane	86		60-140
chlorobenzene-d5	93		60-140

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY
Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-08
Client ID: SG-2
Sample Location: 181 ELLIOT STREET
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15-SIM
Analytical Date: 03/12/15 08:45
Analyst: RY

Date Collected: 03/06/15 18:51
Date Received: 03/10/15
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air by SIM - Mansfield Lab								
Dichlorodifluoromethane	0.379	0.200	0.006	1.87	0.989	0.030		1
Chloromethane	0.100	0.200	0.048	0.207	0.413	0.099	J	1
Freon-114	0.015	0.050	0.005	0.105	0.349	0.035	J	1
Vinyl chloride	ND	0.020	0.007	ND	0.051	0.018		1
1,3-Butadiene	ND	0.020	0.006	ND	0.044	0.013		1
Bromomethane	ND	0.020	0.008	ND	0.078	0.031		1
Chloroethane	ND	0.020	0.007	ND	0.053	0.019		1
Trichlorofluoromethane	0.224	0.050	0.008	1.26	0.281	0.045		1
1,1-Dichloroethene	ND	0.020	0.007	ND	0.079	0.028		1
Methylene chloride	ND	0.500	0.250	ND	1.74	0.869		1
Freon-113	0.071	0.050	0.006	0.544	0.383	0.046		1
trans-1,2-Dichloroethene	ND	0.020	0.006	ND	0.079	0.024		1
1,1-Dichloroethane	ND	0.020	0.007	ND	0.081	0.028		1
Methyl tert butyl ether	ND	0.020	0.004	ND	0.072	0.014		1
cis-1,2-Dichloroethene	ND	0.020	0.007	ND	0.079	0.026		1
Chloroform	0.080	0.020	0.006	0.391	0.098	0.029		1
1,2-Dichloroethane	ND	0.020	0.008	ND	0.081	0.032		1
1,1,1-Trichloroethane	0.008	0.020	0.007	0.044	0.109	0.038	J	1
Benzene	0.036	0.100	0.021	0.115	0.319	0.067	J	1
Carbon tetrachloride	0.070	0.020	0.008	0.440	0.126	0.050		1
1,2-Dichloropropane	ND	0.020	0.006	ND	0.092	0.028		1
Bromodichloromethane	ND	0.020	0.008	ND	0.134	0.054		1
Trichloroethene	0.338	0.020	0.007	1.82	0.107	0.038		1
cis-1,3-Dichloropropene	ND	0.020	0.008	ND	0.091	0.036		1

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY
Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-08
Client ID: SG-2
Sample Location: 181 ELLIOT STREET
Date Collected: 03/06/15 18:51
Date Received: 03/10/15
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air by SIM - Mansfield Lab								
trans-1,3-Dichloropropene	ND	0.020	0.008	ND	0.091	0.036		1
1,1,2-Trichloroethane	ND	0.020	0.009	ND	0.109	0.049		1
Toluene	0.134	0.050	0.025	0.505	0.188	0.094		1
Dibromochloromethane	ND	0.020	0.008	ND	0.170	0.068		1
1,2-Dibromoethane	ND	0.020	0.008	ND	0.154	0.062		1
Tetrachloroethene	0.521	0.020	0.008	3.53	0.136	0.054		1
1,1,1,2-Tetrachloroethane	ND	0.020	0.004	ND	0.137	0.028		1
Chlorobenzene	ND	0.020	0.008	ND	0.092	0.037		1
Ethylbenzene	0.037	0.020	0.007	0.161	0.087	0.030		1
p/m-Xylene	0.140	0.040	0.009	0.608	0.174	0.039		1
Bromoform	ND	0.020	0.015	ND	0.207	0.155		1
Styrene	0.012	0.020	0.008	0.051	0.085	0.034	J	1
1,1,2,2-Tetrachloroethane	ND	0.020	0.007	ND	0.137	0.048		1
o-Xylene	0.055	0.020	0.008	0.239	0.087	0.035		1
1,3,5-Trimethybenzene	0.033	0.020	0.005	0.162	0.098	0.025		1
1,2,4-Trimethylbenzene	0.154	0.020	0.007	0.757	0.098	0.034		1
1,3-Dichlorobenzene	ND	0.020	0.007	ND	0.120	0.042		1
1,4-Dichlorobenzene	0.059	0.020	0.008	0.355	0.120	0.048		1
1,2-Dichlorobenzene	0.229	0.020	0.007	1.38	0.120	0.042		1
1,2,4-Trichlorobenzene	ND	0.050	0.010	ND	0.371	0.074		1
Naphthalene	0.197	0.050	0.012	1.03	0.262	0.063		1
Hexachlorobutadiene	ND	0.050	0.011	ND	0.533	0.117		1

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-difluorobenzene	86		60-140
bromochloromethane	88		60-140
chlorobenzene-d5	97		60-140

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY
Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-09
Client ID: SG-3
Sample Location: 181 ELLIOT STREET
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 03/12/15 01:08
Analyst: RY

Date Collected: 03/06/15 19:31
Date Received: 03/10/15
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Propylene	0.138	0.500	0.093	0.238	0.861	0.160	J	1
Ethanol	2.28	2.50	0.542	4.30	4.71	1.02	J	1
Vinyl bromide	ND	0.200	0.070	ND	0.874	0.306		1
Acetone	1.77	1.00	0.269	4.20	2.38	0.639		1
Isopropanol	ND	0.500	0.114	ND	1.23	0.280		1
3-Chloropropene	ND	0.200	0.081	ND	0.626	0.254		1
Carbon disulfide	0.101	0.200	0.035	0.315	0.623	0.107	J	1
Vinyl acetate	ND	0.200	0.057	ND	0.704	0.200		1
2-Butanone	0.099	0.500	0.052	0.292	1.47	0.154	J	1
Ethyl Acetate	ND	0.500	0.131	ND	1.80	0.472		1
Tetrahydrofuran	ND	0.500	0.062	ND	1.47	0.183		1
n-Hexane	ND	0.200	0.052	ND	0.705	0.183		1
Cyclohexane	ND	0.200	0.066	ND	0.688	0.226		1
1,4-Dioxane	ND	0.200	0.078	ND	0.721	0.281		1
2,2,4-Trimethylpentane	ND	0.200	0.066	ND	0.934	0.308		1
Heptane	ND	0.200	0.055	ND	0.820	0.227		1
4-Methyl-2-pentanone	ND	0.500	0.061	ND	2.05	0.249		1
2-Hexanone	ND	0.200	0.060	ND	0.820	0.248		1
4-Ethyltoluene	ND	0.200	0.078	ND	0.983	0.381		1
Benzyl chloride	ND	0.200	0.065	ND	1.04	0.334		1

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-09
Client ID: SG-3
Sample Location: 181 ELLIOT STREET

Date Collected: 03/06/15 19:31
Date Received: 03/10/15
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air - Mansfield Lab								

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	86		60-140
Bromochloromethane	89		60-140
chlorobenzene-d5	96		60-140

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-09
Client ID: SG-3
Sample Location: 181 ELLIOT STREET
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15-SIM
Analytical Date: 03/12/15 01:08
Analyst: RY

Date Collected: 03/06/15 19:31
Date Received: 03/10/15
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air by SIM - Mansfield Lab								
Dichlorodifluoromethane	0.478	0.200	0.006	2.36	0.989	0.030		1
Chloromethane	0.078	0.200	0.048	0.161	0.413	0.099	J	1
Freon-114	0.016	0.050	0.005	0.112	0.349	0.035	J	1
Vinyl chloride	ND	0.020	0.007	ND	0.051	0.018		1
1,3-Butadiene	0.007	0.020	0.006	0.016	0.044	0.013	J	1
Bromomethane	ND	0.020	0.008	ND	0.078	0.031		1
Chloroethane	0.008	0.020	0.007	0.021	0.053	0.019	J	1
Trichlorofluoromethane	0.213	0.050	0.008	1.20	0.281	0.045		1
1,1-Dichloroethene	ND	0.020	0.007	ND	0.079	0.028		1
Methylene chloride	ND	0.500	0.250	ND	1.74	0.869		1
Freon-113	0.069	0.050	0.006	0.529	0.383	0.046		1
trans-1,2-Dichloroethene	ND	0.020	0.006	ND	0.079	0.024		1
1,1-Dichloroethane	ND	0.020	0.007	ND	0.081	0.028		1
Methyl tert butyl ether	ND	0.020	0.004	ND	0.072	0.014		1
cis-1,2-Dichloroethene	ND	0.020	0.007	ND	0.079	0.026		1
Chloroform	0.059	0.020	0.006	0.288	0.098	0.029		1
1,2-Dichloroethane	ND	0.020	0.008	ND	0.081	0.032		1
1,1,1-Trichloroethane	0.010	0.020	0.007	0.055	0.109	0.038	J	1
Benzene	0.083	0.100	0.021	0.265	0.319	0.067	J	1
Carbon tetrachloride	0.071	0.020	0.008	0.447	0.126	0.050		1
1,2-Dichloropropane	ND	0.020	0.006	ND	0.092	0.028		1
Bromodichloromethane	ND	0.020	0.008	ND	0.134	0.054		1
Trichloroethene	0.400	0.020	0.007	2.15	0.107	0.038		1
cis-1,3-Dichloropropene	ND	0.020	0.008	ND	0.091	0.036		1

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY
Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-09
Client ID: SG-3
Sample Location: 181 ELLIOT STREET
Date Collected: 03/06/15 19:31
Date Received: 03/10/15
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air by SIM - Mansfield Lab								
trans-1,3-Dichloropropene	ND	0.020	0.008	ND	0.091	0.036		1
1,1,2-Trichloroethane	ND	0.020	0.009	ND	0.109	0.049		1
Toluene	0.377	0.050	0.025	1.42	0.188	0.094		1
Dibromochloromethane	ND	0.020	0.008	ND	0.170	0.068		1
1,2-Dibromoethane	ND	0.020	0.008	ND	0.154	0.062		1
Tetrachloroethene	0.505	0.020	0.008	3.42	0.136	0.054		1
1,1,1,2-Tetrachloroethane	ND	0.020	0.004	ND	0.137	0.028		1
Chlorobenzene	ND	0.020	0.008	ND	0.092	0.037		1
Ethylbenzene	0.035	0.020	0.007	0.152	0.087	0.030		1
p/m-Xylene	0.132	0.040	0.009	0.573	0.174	0.039		1
Bromoform	ND	0.020	0.015	ND	0.207	0.155		1
Styrene	0.029	0.020	0.008	0.123	0.085	0.034		1
1,1,2,2-Tetrachloroethane	ND	0.020	0.007	ND	0.137	0.048		1
o-Xylene	0.039	0.020	0.008	0.169	0.087	0.035		1
1,3,5-Trimethybenzene	0.019	0.020	0.005	0.093	0.098	0.025	J	1
1,2,4-Trimethylbenzene	0.068	0.020	0.007	0.334	0.098	0.034		1
1,3-Dichlorobenzene	ND	0.020	0.007	ND	0.120	0.042		1
1,4-Dichlorobenzene	0.039	0.020	0.008	0.234	0.120	0.048		1
1,2-Dichlorobenzene	0.042	0.020	0.007	0.253	0.120	0.042		1
1,2,4-Trichlorobenzene	ND	0.050	0.010	ND	0.371	0.074		1
Naphthalene	0.157	0.050	0.012	0.823	0.262	0.063		1
Hexachlorobutadiene	ND	0.050	0.011	ND	0.533	0.117		1

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-difluorobenzene	86		60-140
bromochloromethane	91		60-140
chlorobenzene-d5	97		60-140

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY
Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-10
Client ID: SG-4
Sample Location: 181 ELLIOT STREET
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 03/12/15 01:40
Analyst: RY

Date Collected: 03/06/15 20:02
Date Received: 03/10/15
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Propylene	9.02	0.500	0.093	15.5	0.861	0.160		1
Ethanol	3.47	2.50	0.542	6.54	4.71	1.02		1
Vinyl bromide	ND	0.200	0.070	ND	0.874	0.306		1
Acetone	11.1	1.00	0.269	26.4	2.38	0.639		1
Isopropanol	7.69	0.500	0.114	18.9	1.23	0.280		1
3-Chloropropene	ND	0.200	0.081	ND	0.626	0.254		1
Carbon disulfide	4.10	0.200	0.035	12.8	0.623	0.107		1
Vinyl acetate	ND	0.200	0.057	ND	0.704	0.200		1
2-Butanone	0.389	0.500	0.052	1.15	1.47	0.154	J	1
Ethyl Acetate	ND	0.500	0.131	ND	1.80	0.472		1
Tetrahydrofuran	ND	0.500	0.062	ND	1.47	0.183		1
n-Hexane	3.99	0.200	0.052	14.1	0.705	0.183		1
Cyclohexane	3.04	0.200	0.066	10.5	0.688	0.226		1
1,4-Dioxane	ND	0.200	0.078	ND	0.721	0.281		1
2,2,4-Trimethylpentane	ND	0.200	0.066	ND	0.934	0.308		1
Heptane	1.21	0.200	0.055	4.96	0.820	0.227		1
4-Methyl-2-pentanone	ND	0.500	0.061	ND	2.05	0.249		1
2-Hexanone	ND	0.200	0.060	ND	0.820	0.248		1
4-Ethyltoluene	ND	0.200	0.078	ND	0.983	0.381		1
Benzyl chloride	ND	0.200	0.065	ND	1.04	0.334		1

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-10
Client ID: SG-4
Sample Location: 181 ELLIOT STREET

Date Collected: 03/06/15 20:02
Date Received: 03/10/15
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	87		60-140
Bromochloromethane	90		60-140
chlorobenzene-d5	101		60-140

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-10
Client ID: SG-4
Sample Location: 181 ELLIOT STREET
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15-SIM
Analytical Date: 03/12/15 01:40
Analyst: RY

Date Collected: 03/06/15 20:02
Date Received: 03/10/15
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air by SIM - Mansfield Lab								
Dichlorodifluoromethane	0.054	0.200	0.006	0.267	0.989	0.030	J	1
Chloromethane	ND	0.200	0.048	ND	0.413	0.099		1
Freon-114	0.016	0.050	0.005	0.112	0.349	0.035	J	1
Vinyl chloride	0.127	0.020	0.007	0.325	0.051	0.018		1
1,3-Butadiene	ND	0.020	0.006	ND	0.044	0.013		1
Bromomethane	ND	0.020	0.008	ND	0.078	0.031		1
Chloroethane	0.026	0.020	0.007	0.069	0.053	0.019		1
Trichlorofluoromethane	ND	0.050	0.008	ND	0.281	0.045		1
1,1-Dichloroethene	0.007	0.020	0.007	0.028	0.079	0.028	J	1
Methylene chloride	ND	0.500	0.250	ND	1.74	0.869		1
Freon-113	ND	0.050	0.006	ND	0.383	0.046		1
trans-1,2-Dichloroethene	0.026	0.020	0.006	0.103	0.079	0.024		1
1,1-Dichloroethane	0.106	0.020	0.007	0.429	0.081	0.028		1
Methyl tert butyl ether	ND	0.020	0.004	ND	0.072	0.014		1
cis-1,2-Dichloroethene	0.120	0.020	0.007	0.476	0.079	0.026		1
Chloroform	0.008	0.020	0.006	0.039	0.098	0.029	J	1
1,2-Dichloroethane	ND	0.020	0.008	ND	0.081	0.032		1
1,1,1-Trichloroethane	ND	0.020	0.007	ND	0.109	0.038		1
Benzene	0.947	0.100	0.021	3.03	0.319	0.067		1
Carbon tetrachloride	ND	0.020	0.008	ND	0.126	0.050		1
1,2-Dichloropropane	ND	0.020	0.006	ND	0.092	0.028		1
Bromodichloromethane	ND	0.020	0.008	ND	0.134	0.054		1
Trichloroethene	0.023	0.020	0.007	0.124	0.107	0.038		1
cis-1,3-Dichloropropene	ND	0.020	0.008	ND	0.091	0.036		1

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY
Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-10
Client ID: SG-4
Sample Location: 181 ELLIOT STREET
Date Collected: 03/06/15 20:02
Date Received: 03/10/15
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air by SIM - Mansfield Lab								
trans-1,3-Dichloropropene	ND	0.020	0.008	ND	0.091	0.036		1
1,1,2-Trichloroethane	ND	0.020	0.009	ND	0.109	0.049		1
Toluene	0.260	0.050	0.025	0.980	0.188	0.094		1
Dibromochloromethane	ND	0.020	0.008	ND	0.170	0.068		1
1,2-Dibromoethane	ND	0.020	0.008	ND	0.154	0.062		1
Tetrachloroethene	0.018	0.020	0.008	0.122	0.136	0.054	J	1
1,1,1,2-Tetrachloroethane	ND	0.020	0.004	ND	0.137	0.028		1
Chlorobenzene	ND	0.020	0.008	ND	0.092	0.037		1
Ethylbenzene	0.092	0.020	0.007	0.400	0.087	0.030		1
p/m-Xylene	0.313	0.040	0.009	1.36	0.174	0.039		1
Bromoform	ND	0.020	0.015	ND	0.207	0.155		1
Styrene	ND	0.020	0.008	ND	0.085	0.034		1
1,1,2,2-Tetrachloroethane	ND	0.020	0.007	ND	0.137	0.048		1
o-Xylene	0.159	0.020	0.008	0.691	0.087	0.035		1
1,3,5-Trimethybenzene	0.095	0.020	0.005	0.467	0.098	0.025		1
1,2,4-Trimethylbenzene	0.170	0.020	0.007	0.836	0.098	0.034		1
1,3-Dichlorobenzene	ND	0.020	0.007	ND	0.120	0.042		1
1,4-Dichlorobenzene	0.032	0.020	0.008	0.192	0.120	0.048		1
1,2-Dichlorobenzene	ND	0.020	0.007	ND	0.120	0.042		1
1,2,4-Trichlorobenzene	ND	0.050	0.010	ND	0.371	0.074		1
Naphthalene	0.140	0.050	0.012	0.734	0.262	0.063		1
Hexachlorobutadiene	ND	0.050	0.011	ND	0.533	0.117		1

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-difluorobenzene	87		60-140
bromochloromethane	92		60-140
chlorobenzene-d5	102		60-140

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY
Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-11
Client ID: SG BLANK
Sample Location: 181 ELLIOT STREET
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 03/11/15 20:19
Analyst: RY

Date Collected: 03/06/15 00:00
Date Received: 03/10/15
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Propylene	ND	0.500	0.093	ND	0.861	0.160		1
Ethanol	0.682	2.50	0.542	1.29	4.71	1.02	J	1
Vinyl bromide	ND	0.200	0.070	ND	0.874	0.306		1
Acetone	0.272	1.00	0.269	0.646	2.38	0.639	J	1
Isopropanol	ND	0.500	0.114	ND	1.23	0.280		1
3-Chloropropene	ND	0.200	0.081	ND	0.626	0.254		1
Carbon disulfide	ND	0.200	0.035	ND	0.623	0.107		1
Vinyl acetate	ND	0.200	0.057	ND	0.704	0.200		1
2-Butanone	0.092	0.500	0.052	0.271	1.47	0.154	J	1
Ethyl Acetate	ND	0.500	0.131	ND	1.80	0.472		1
Tetrahydrofuran	ND	0.500	0.062	ND	1.47	0.183		1
n-Hexane	ND	0.200	0.052	ND	0.705	0.183		1
Cyclohexane	ND	0.200	0.066	ND	0.688	0.226		1
1,4-Dioxane	ND	0.200	0.078	ND	0.721	0.281		1
2,2,4-Trimethylpentane	ND	0.200	0.066	ND	0.934	0.308		1
Heptane	ND	0.200	0.055	ND	0.820	0.227		1
4-Methyl-2-pentanone	ND	0.500	0.061	ND	2.05	0.249		1
2-Hexanone	ND	0.200	0.060	ND	0.820	0.248		1
4-Ethyltoluene	ND	0.200	0.078	ND	0.983	0.381		1
Benzyl chloride	ND	0.200	0.065	ND	1.04	0.334		1

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-11
Client ID: SG BLANK
Sample Location: 181 ELLIOT STREET

Date Collected: 03/06/15 00:00
Date Received: 03/10/15
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air - Mansfield Lab								

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	95		60-140
Bromochloromethane	92		60-140
chlorobenzene-d5	95		60-140

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-11
Client ID: SG BLANK
Sample Location: 181 ELLIOT STREET
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15-SIM
Analytical Date: 03/11/15 20:19
Analyst: RY

Date Collected: 03/06/15 00:00
Date Received: 03/10/15
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air by SIM - Mansfield Lab								
Dichlorodifluoromethane	0.007	0.200	0.006	0.035	0.989	0.030	J	1
Chloromethane	ND	0.200	0.048	ND	0.413	0.099		1
Freon-114	ND	0.050	0.005	ND	0.349	0.035		1
Vinyl chloride	ND	0.020	0.007	ND	0.051	0.018		1
1,3-Butadiene	ND	0.020	0.006	ND	0.044	0.013		1
Bromomethane	ND	0.020	0.008	ND	0.078	0.031		1
Chloroethane	ND	0.020	0.007	ND	0.053	0.019		1
Trichlorofluoromethane	ND	0.050	0.008	ND	0.281	0.045		1
1,1-Dichloroethene	ND	0.020	0.007	ND	0.079	0.028		1
Methylene chloride	ND	0.500	0.250	ND	1.74	0.869		1
Freon-113	ND	0.050	0.006	ND	0.383	0.046		1
trans-1,2-Dichloroethene	ND	0.020	0.006	ND	0.079	0.024		1
1,1-Dichloroethane	ND	0.020	0.007	ND	0.081	0.028		1
Methyl tert butyl ether	ND	0.020	0.004	ND	0.072	0.014		1
cis-1,2-Dichloroethene	ND	0.020	0.007	ND	0.079	0.026		1
Chloroform	ND	0.020	0.006	ND	0.098	0.029		1
1,2-Dichloroethane	ND	0.020	0.008	ND	0.081	0.032		1
1,1,1-Trichloroethane	ND	0.020	0.007	ND	0.109	0.038		1
Benzene	ND	0.100	0.021	ND	0.319	0.067		1
Carbon tetrachloride	ND	0.020	0.008	ND	0.126	0.050		1
1,2-Dichloropropane	ND	0.020	0.006	ND	0.092	0.028		1
Bromodichloromethane	ND	0.020	0.008	ND	0.134	0.054		1
Trichloroethene	ND	0.020	0.007	ND	0.107	0.038		1
cis-1,3-Dichloropropene	ND	0.020	0.008	ND	0.091	0.036		1

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID: L1504425-11
Client ID: SG BLANK
Sample Location: 181 ELLIOT STREET

Date Collected: 03/06/15 00:00
Date Received: 03/10/15
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air by SIM - Mansfield Lab								
trans-1,3-Dichloropropene	ND	0.020	0.008	ND	0.091	0.036		1
1,1,2-Trichloroethane	ND	0.020	0.009	ND	0.109	0.049		1
Toluene	ND	0.050	0.025	ND	0.188	0.094		1
Dibromochloromethane	ND	0.020	0.008	ND	0.170	0.068		1
1,2-Dibromoethane	ND	0.020	0.008	ND	0.154	0.062		1
Tetrachloroethene	ND	0.020	0.008	ND	0.136	0.054		1
1,1,1,2-Tetrachloroethane	ND	0.020	0.004	ND	0.137	0.028		1
Chlorobenzene	ND	0.020	0.008	ND	0.092	0.037		1
Ethylbenzene	ND	0.020	0.007	ND	0.087	0.030		1
p/m-Xylene	0.018	0.040	0.009	0.078	0.174	0.039	J	1
Bromoform	ND	0.020	0.015	ND	0.207	0.155		1
Styrene	ND	0.020	0.008	ND	0.085	0.034		1
1,1,2,2-Tetrachloroethane	ND	0.020	0.007	ND	0.137	0.048		1
o-Xylene	ND	0.020	0.008	ND	0.087	0.035		1
1,3,5-Trimethybenzene	0.007	0.020	0.005	0.034	0.098	0.025	J	1
1,2,4-Trimethylbenzene	0.035	0.020	0.007	0.172	0.098	0.034		1
1,3-Dichlorobenzene	ND	0.020	0.007	ND	0.120	0.042		1
1,4-Dichlorobenzene	ND	0.020	0.008	ND	0.120	0.048		1
1,2-Dichlorobenzene	ND	0.020	0.007	ND	0.120	0.042		1
1,2,4-Trichlorobenzene	ND	0.050	0.010	ND	0.371	0.074		1
Naphthalene	ND	0.050	0.012	ND	0.262	0.063		1
Hexachlorobutadiene	ND	0.050	0.011	ND	0.533	0.117		1

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-difluorobenzene	93		60-140
bromochloromethane	95		60-140
chlorobenzene-d5	95		60-140

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY
Lab Number: L1504425
Report Date: 03/25/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 48,TO-15
Analytical Date: 03/11/15 13:49

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air - Mansfield Lab for sample(s): 01-11 Batch: WG767577-4								
Propylene	ND	0.500	0.093	ND	0.861	0.160		1
Ethanol	ND	2.50	0.542	ND	4.71	1.02		1
Vinyl bromide	ND	0.200	0.070	ND	0.874	0.306		1
Acetone	ND	1.00	0.269	ND	2.38	0.639		1
Isopropanol	ND	0.500	0.114	ND	1.23	0.280		1
3-Chloropropene	ND	0.200	0.081	ND	0.626	0.254		1
Carbon disulfide	ND	0.200	0.035	ND	0.623	0.107		1
Vinyl acetate	ND	0.200	0.057	ND	0.704	0.200		1
2-Butanone	ND	0.500	0.052	ND	1.47	0.154		1
Ethyl Acetate	ND	0.500	0.131	ND	1.80	0.472		1
Tetrahydrofuran	ND	0.500	0.062	ND	1.47	0.183		1
n-Hexane	ND	0.200	0.052	ND	0.705	0.183		1
Cyclohexane	ND	0.200	0.066	ND	0.688	0.226		1
1,4-Dioxane	ND	0.200	0.078	ND	0.721	0.281		1
2,2,4-Trimethylpentane	ND	0.200	0.066	ND	0.934	0.308		1
Heptane	ND	0.200	0.055	ND	0.820	0.227		1
4-Methyl-2-pentanone	ND	0.500	0.061	ND	2.05	0.249		1
2-Hexanone	ND	0.200	0.060	ND	0.820	0.248		1
4-Ethyltoluene	ND	0.200	0.078	ND	0.983	0.381		1
Benzyl chloride	ND	0.200	0.065	ND	1.04	0.334		1

	Results	Qualifier	Units	RDL	Dilution Factor
Tentatively Identified Compounds					

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 48,TO-15
Analytical Date: 03/11/15 13:49

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air - Mansfield Lab for sample(s): 01-11 Batch: WG767577-4								

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY
Lab Number: L1504425
Report Date: 03/25/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 48,TO-15-SIM
Analytical Date: 03/11/15 14:34

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air by SIM - Mansfield Lab for sample(s): 01-11 Batch: WG767579-4								
Dichlorodifluoromethane	ND	0.200	0.006	ND	0.989	0.030		1
Chloromethane	ND	0.200	0.048	ND	0.413	0.099		1
Freon-114	ND	0.050	0.005	ND	0.349	0.035		1
Vinyl chloride	ND	0.020	0.007	ND	0.051	0.018		1
1,3-Butadiene	ND	0.020	0.006	ND	0.044	0.013		1
Bromomethane	ND	0.020	0.008	ND	0.078	0.031		1
Chloroethane	ND	0.020	0.007	ND	0.053	0.019		1
Trichlorofluoromethane	ND	0.050	0.008	ND	0.281	0.045		1
1,1-Dichloroethene	ND	0.020	0.007	ND	0.079	0.028		1
Methylene chloride	ND	0.500	0.250	ND	1.74	0.869		1
Freon-113	ND	0.050	0.006	ND	0.383	0.046		1
trans-1,2-Dichloroethene	ND	0.020	0.006	ND	0.079	0.024		1
1,1-Dichloroethane	ND	0.020	0.007	ND	0.081	0.028		1
Methyl tert butyl ether	ND	0.020	0.004	ND	0.072	0.014		1
cis-1,2-Dichloroethene	ND	0.020	0.007	ND	0.079	0.026		1
Chloroform	ND	0.020	0.006	ND	0.098	0.029		1
1,2-Dichloroethane	ND	0.020	0.008	ND	0.081	0.032		1
1,1,1-Trichloroethane	ND	0.020	0.007	ND	0.109	0.038		1
Benzene	ND	0.100	0.021	ND	0.319	0.067		1
Carbon tetrachloride	ND	0.020	0.008	ND	0.126	0.050		1
1,2-Dichloropropane	ND	0.020	0.006	ND	0.092	0.028		1
Bromodichloromethane	ND	0.020	0.008	ND	0.134	0.054		1
Trichloroethene	ND	0.020	0.007	ND	0.107	0.038		1
cis-1,3-Dichloropropene	ND	0.020	0.008	ND	0.091	0.036		1
trans-1,3-Dichloropropene	ND	0.020	0.008	ND	0.091	0.036		1

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY
Lab Number: L1504425
Report Date: 03/25/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 48,TO-15-SIM
Analytical Date: 03/11/15 14:34

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air by SIM - Mansfield Lab for sample(s): 01-11 Batch: WG767579-4								
1,1,2-Trichloroethane	ND	0.020	0.009	ND	0.109	0.049		1
Toluene	ND	0.050	0.025	ND	0.188	0.094		1
Dibromochloromethane	ND	0.020	0.008	ND	0.170	0.068		1
1,2-Dibromoethane	ND	0.020	0.008	ND	0.154	0.062		1
Tetrachloroethene	ND	0.020	0.008	ND	0.136	0.054		1
1,1,1,2-Tetrachloroethane	ND	0.020	0.004	ND	0.137	0.028		1
Chlorobenzene	ND	0.020	0.008	ND	0.092	0.037		1
Ethylbenzene	ND	0.020	0.007	ND	0.087	0.030		1
p/m-Xylene	ND	0.040	0.009	ND	0.174	0.039		1
Bromoform	ND	0.020	0.015	ND	0.207	0.155		1
Styrene	ND	0.020	0.008	ND	0.085	0.034		1
1,1,2,2-Tetrachloroethane	ND	0.020	0.007	ND	0.137	0.048		1
o-Xylene	ND	0.020	0.008	ND	0.087	0.035		1
1,3,5-Trimethybenzene	ND	0.020	0.005	ND	0.098	0.025		1
1,2,4-Trimethylbenzene	ND	0.020	0.007	ND	0.098	0.034		1
1,3-Dichlorobenzene	ND	0.020	0.007	ND	0.120	0.042		1
1,4-Dichlorobenzene	ND	0.020	0.008	ND	0.120	0.048		1
1,2-Dichlorobenzene	ND	0.020	0.007	ND	0.120	0.042		1
1,2,4-Trichlorobenzene	0.011	0.050	0.010	0.082	0.371	0.074	J	1
Naphthalene	0.015	0.050	0.012	0.079	0.262	0.063	J	1
Hexachlorobutadiene	ND	0.050	0.011	ND	0.533	0.117		1

Lab Control Sample Analysis

Batch Quality Control

Project Name: CUMMINGS BEVERLY

Project Number: CUMMINGS BEVERLY

Lab Number: L1504425

Report Date: 03/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01-11 Batch: WG767577-3								
Chlorodifluoromethane	86		-		70-130	-		
Propylene	102		-		70-130	-		
Propane	79		-		70-130	-		
Dichlorodifluoromethane	72		-		70-130	-		
Chloromethane	88		-		70-130	-		
1,2-Dichloro-1,1,2,2-tetrafluoroethane	94		-		70-130	-		
Methanol	85		-		70-130	-		
Vinyl chloride	94		-		70-130	-		
1,3-Butadiene	97		-		70-130	-		
Butane	84		-		70-130	-		
Bromomethane	86		-		70-130	-		
Chloroethane	89		-		70-130	-		
Ethyl Alcohol	85		-		70-130	-		
Dichlorofluoromethane	86		-		70-130	-		
Vinyl bromide	93		-		70-130	-		
Acrolein	72		-		70-130	-		
Acetone	95		-		70-130	-		
Acetonitrile	84		-		70-130	-		
Trichlorofluoromethane	95		-		70-130	-		
iso-Propyl Alcohol	91		-		70-130	-		
Acrylonitrile	79		-		70-130	-		

Lab Control Sample Analysis

Batch Quality Control

Project Name: CUMMINGS BEVERLY

Project Number: CUMMINGS BEVERLY

Lab Number: L1504425

Report Date: 03/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01-11 Batch: WG767577-3								
Pentane	80		-		70-130	-		
Ethyl ether	75		-		70-130	-		
1,1-Dichloroethene	92		-		70-130	-		
tert-Butyl Alcohol	86		-		70-130	-		
Methylene chloride	94		-		70-130	-		
3-Chloropropene	84		-		70-130	-		
Carbon disulfide	91		-		70-130	-		
1,1,2-Trichloro-1,2,2-Trifluoroethane	94		-		70-130	-		
trans-1,2-Dichloroethene	86		-		70-130	-		
1,1-Dichloroethane	92		-		70-130	-		
Methyl tert butyl ether	87		-		70-130	-		
Vinyl acetate	115		-		70-130	-		
2-Butanone	97		-		70-130	-		
cis-1,2-Dichloroethene	101		-		70-130	-		
Ethyl Acetate	90		-		70-130	-		
Chloroform	93		-		70-130	-		
Tetrahydrofuran	77		-		70-130	-		
2,2-Dichloropropane	82		-		70-130	-		
1,2-Dichloroethane	95		-		70-130	-		
n-Hexane	90		-		70-130	-		
Isopropyl Ether	86		-		70-130	-		

Lab Control Sample Analysis
Batch Quality Control

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01-11 Batch: WG767577-3								
Ethyl-Tert-Butyl-Ether	85		-		70-130	-		
1,1,1-Trichloroethane	94		-		70-130	-		
1,1-Dichloropropene	91		-		70-130	-		
Benzene	96		-		70-130	-		
Carbon tetrachloride	91		-		70-130	-		
Cyclohexane	91		-		70-130	-		
Tertiary-Amyl Methyl Ether	86		-		70-130	-		
Dibromomethane	92		-		70-130	-		
1,2-Dichloropropane	96		-		70-130	-		
Bromodichloromethane	96		-		70-130	-		
1,4-Dioxane	97		-		70-130	-		
Trichloroethene	94		-		70-130	-		
2,2,4-Trimethylpentane	93		-		70-130	-		
Methyl Methacrylate	86		-		70-130	-		
Heptane	87		-		70-130	-		
cis-1,3-Dichloropropene	99		-		70-130	-		
4-Methyl-2-pentanone	93		-		70-130	-		
trans-1,3-Dichloropropene	84		-		70-130	-		
1,1,2-Trichloroethane	96		-		70-130	-		
Toluene	93		-		70-130	-		
1,3-Dichloropropane	89		-		70-130	-		

Lab Control Sample Analysis

Batch Quality Control

Project Name: CUMMINGS BEVERLY

Project Number: CUMMINGS BEVERLY

Lab Number: L1504425

Report Date: 03/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01-11 Batch: WG767577-3								
2-Hexanone	96		-		70-130	-		
Dibromochloromethane	89		-		70-130	-		
1,2-Dibromoethane	94		-		70-130	-		
Butyl Acetate	82		-		70-130	-		
Octane	83		-		70-130	-		
Tetrachloroethene	90		-		70-130	-		
1,1,1,2-Tetrachloroethane	86		-		70-130	-		
Chlorobenzene	92		-		70-130	-		
Ethylbenzene	92		-		70-130	-		
p/m-Xylene	92		-		70-130	-		
Bromoform	88		-		70-130	-		
Styrene	91		-		70-130	-		
1,1,2,2-Tetrachloroethane	97		-		70-130	-		
o-Xylene	95		-		70-130	-		
1,2,3-Trichloropropane	90		-		70-130	-		
Nonane (C9)	83		-		70-130	-		
Isopropylbenzene	91		-		70-130	-		
Bromobenzene	89		-		70-130	-		
o-Chlorotoluene	84		-		70-130	-		
n-Propylbenzene	89		-		70-130	-		
p-Chlorotoluene	89		-		70-130	-		

Lab Control Sample Analysis

Batch Quality Control

Project Name: CUMMINGS BEVERLY

Project Number: CUMMINGS BEVERLY

Lab Number: L1504425

Report Date: 03/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01-11 Batch: WG767577-3								
4-Ethyltoluene	88		-		70-130	-		
1,3,5-Trimethylbenzene	93		-		70-130	-		
tert-Butylbenzene	88		-		70-130	-		
1,2,4-Trimethylbenzene	96		-		70-130	-		
Decane (C10)	86		-		70-130	-		
Benzyl chloride	87		-		70-130	-		
1,3-Dichlorobenzene	94		-		70-130	-		
1,4-Dichlorobenzene	95		-		70-130	-		
sec-Butylbenzene	89		-		70-130	-		
p-Isopropyltoluene	81		-		70-130	-		
1,2-Dichlorobenzene	94		-		70-130	-		
n-Butylbenzene	94		-		70-130	-		
1,2-Dibromo-3-chloropropane	87		-		70-130	-		
Undecane	92		-		70-130	-		
Dodecane (C12)	96		-		70-130	-		
1,2,4-Trichlorobenzene	99		-		70-130	-		
Naphthalene	92		-		70-130	-		
1,2,3-Trichlorobenzene	97		-		70-130	-		
Hexachlorobutadiene	103		-		70-130	-		

Lab Control Sample Analysis
Batch Quality Control

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics in Air by SIM - Mansfield Lab Associated sample(s): 01-11 Batch: WG767579-3								
Propylene	102		-		70-130	-		25
Dichlorodifluoromethane	87		-		70-130	-		25
Chloromethane	91		-		70-130	-		25
1,2-Dichloro-1,1,2,2-tetrafluoroethane	93		-		70-130	-		25
Vinyl chloride	90		-		70-130	-		25
1,3-Butadiene	89		-		70-130	-		25
Bromomethane	92		-		70-130	-		25
Chloroethane	85		-		70-130	-		25
Ethyl Alcohol	86		-		70-130	-		25
Vinyl bromide	88		-		70-130	-		25
Acetone	96		-		70-130	-		25
Trichlorofluoromethane	93		-		70-130	-		25
iso-Propyl Alcohol	97		-		70-130	-		25
Acrylonitrile	77		-		70-130	-		25
1,1-Dichloroethene	90		-		70-130	-		25
Methylene chloride	97		-		70-130	-		25
3-Chloropropene	92		-		70-130	-		25
Carbon disulfide	87		-		70-130	-		25
1,1,2-Trichloro-1,2,2-Trifluoroethane	94		-		70-130	-		25
Halothane	84		-		70-130	-		25
trans-1,2-Dichloroethene	84		-		70-130	-		25

Lab Control Sample Analysis

Batch Quality Control

Project Name: CUMMINGS BEVERLY

Project Number: CUMMINGS BEVERLY

Lab Number: L1504425

Report Date: 03/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics in Air by SIM - Mansfield Lab Associated sample(s): 01-11 Batch: WG767579-3								
1,1-Dichloroethane	92		-		70-130	-		25
Methyl tert butyl ether	88		-		70-130	-		25
Vinyl acetate	112		-		70-130	-		25
2-Butanone	97		-		70-130	-		25
cis-1,2-Dichloroethene	100		-		70-130	-		25
Ethyl Acetate	89		-		70-130	-		25
Chloroform	91		-		70-130	-		25
Tetrahydrofuran	87		-		70-130	-		25
1,2-Dichloroethane	91		-		70-130	-		25
n-Hexane	86		-		70-130	-		25
1,1,1-Trichloroethane	93		-		70-130	-		25
Benzene	90		-		70-130	-		25
Carbon tetrachloride	92		-		70-130	-		25
Cyclohexane	86		-		70-130	-		25
1,2-Dichloropropane	93		-		70-130	-		25
Bromodichloromethane	90		-		70-130	-		25
1,4-Dioxane	96		-		70-130	-		25
Trichloroethene	91		-		70-130	-		25
2,2,4-Trimethylpentane	91		-		70-130	-		25
cis-1,3-Dichloropropene	98		-		70-130	-		25
4-Methyl-2-pentanone	101		-		70-130	-		25

Lab Control Sample Analysis

Batch Quality Control

Project Name: CUMMINGS BEVERLY

Project Number: CUMMINGS BEVERLY

Lab Number: L1504425

Report Date: 03/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics in Air by SIM - Mansfield Lab Associated sample(s): 01-11 Batch: WG767579-3								
trans-1,3-Dichloropropene	86		-		70-130	-		25
1,1,2-Trichloroethane	96		-		70-130	-		25
Toluene	93		-		70-130	-		25
2-Hexanone	109		-		70-130	-		25
Dibromochloromethane	88		-		70-130	-		25
1,2-Dibromoethane	97		-		70-130	-		25
Tetrachloroethene	87		-		70-130	-		25
1,1,1,2-Tetrachloroethane	84		-		70-130	-		25
Chlorobenzene	94		-		70-130	-		25
Ethylbenzene	92		-		70-130	-		25
p/m-Xylene	94		-		70-130	-		25
Bromoform	83		-		70-130	-		25
Styrene	96		-		70-130	-		25
1,1,2,2-Tetrachloroethane	97		-		70-130	-		25
o-Xylene	93		-		70-130	-		25
Isopropylbenzene	91		-		70-130	-		25
4-Ethyltoluene	90		-		70-130	-		25
1,3,5-Trimethylbenzene	95		-		70-130	-		25
1,2,4-Trimethylbenzene	94		-		70-130	-		25
Benzyl chloride	84		-		70-130	-		25
1,3-Dichlorobenzene	96		-		70-130	-		25

Lab Control Sample Analysis

Batch Quality Control

Project Name: CUMMINGS BEVERLY

Project Number: CUMMINGS BEVERLY

Lab Number: L1504425

Report Date: 03/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics in Air by SIM - Mansfield Lab Associated sample(s): 01-11 Batch: WG767579-3								
1,4-Dichlorobenzene	94		-		70-130	-		25
sec-Butylbenzene	89		-		70-130	-		25
p-Isopropyltoluene	82		-		70-130	-		25
1,2-Dichlorobenzene	94		-		70-130	-		25
n-Butylbenzene	95		-		70-130	-		25
1,2,4-Trichlorobenzene	103		-		70-130	-		25
Naphthalene	93		-		70-130	-		25
1,2,3-Trichlorobenzene	104		-		70-130	-		25
Hexachlorobutadiene	98		-		70-130	-		25

Lab Duplicate Analysis
Batch Quality Control

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVER

Lab Number: L1504425
Report Date: 03/25/15

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01-11 QC Batch ID: WG767577-5 QC Sample: L1504425-07 Client ID: SG-1						
Propylene	0.156J	0.110J	ppbV	NC		25
Ethanol	3.83	4.10	ppbV	7		25
Vinyl bromide	ND	ND	ppbV	NC		25
Acetone	7.25	7.87	ppbV	8		25
Isopropanol	ND	ND	ppbV	NC		25
3-Chloropropene	ND	ND	ppbV	NC		25
Carbon disulfide	0.120J	0.103J	ppbV	NC		25
Vinyl acetate	ND	ND	ppbV	NC		25
2-Butanone	0.369J	0.445J	ppbV	NC		25
Ethyl Acetate	ND	ND	ppbV	NC		25
Tetrahydrofuran	ND	ND	ppbV	NC		25
n-Hexane	ND	ND	ppbV	NC		25
Cyclohexane	ND	ND	ppbV	NC		25
1,4-Dioxane	ND	ND	ppbV	NC		25
2,2,4-Trimethylpentane	ND	ND	ppbV	NC		25
Heptane	ND	ND	ppbV	NC		25
4-Methyl-2-pentanone	ND	ND	ppbV	NC		25
2-Hexanone	ND	ND	ppbV	NC		25
4-Ethyltoluene	0.517	0.532	ppbV	3		25

Lab Duplicate Analysis
Batch Quality Control

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVER

Lab Number: L1504425
Report Date: 03/25/15

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01-11 QC Batch ID: WG767577-5 QC Sample: L1504425-07 Client ID: SG-1					
Benzyl chloride	ND	ND	ppbV	NC	25

Lab Duplicate Analysis
Batch Quality Control

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVER

Lab Number: L1504425
Report Date: 03/25/15

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Volatile Organics in Air by SIM - Mansfield Lab Associated sample(s): 01-11 QC Batch ID: WG767579-5 QC Sample: L1504425-07 Client ID: SG-1					
Dichlorodifluoromethane	0.336	0.338	ppbV	1	25
Chloromethane	0.049J	0.051J	ppbV	NC	25
Freon-114	0.014J	0.015J	ppbV	NC	25
Vinyl chloride	ND	ND	ppbV	NC	25
1,3-Butadiene	ND	ND	ppbV	NC	25
Bromomethane	ND	ND	ppbV	NC	25
Chloroethane	ND	0.017J	ppbV	NC	25
Trichlorofluoromethane	0.216	0.208	ppbV	4	25
1,1-Dichloroethene	ND	ND	ppbV	NC	25
Methylene chloride	ND	ND	ppbV	NC	25
Freon-113	0.068	0.066	ppbV	3	25
trans-1,2-Dichloroethene	ND	ND	ppbV	NC	25
1,1-Dichloroethane	0.007J	ND	ppbV	NC	25
Methyl tert butyl ether	ND	ND	ppbV	NC	25
cis-1,2-Dichloroethene	ND	ND	ppbV	NC	25
Chloroform	0.052	0.053	ppbV	2	25
1,2-Dichloroethane	ND	ND	ppbV	NC	25
1,1,1-Trichloroethane	0.025	0.027	ppbV	8	25
Benzene	0.035J	0.039J	ppbV	NC	25

Lab Duplicate Analysis
Batch Quality Control

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVER

Lab Number: L1504425
Report Date: 03/25/15

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Volatile Organics in Air by SIM - Mansfield Lab Associated sample(s): 01-11 QC Batch ID: WG767579-5 QC Sample: L1504425-07 Client ID: SG-1					
Carbon tetrachloride	0.061	0.064	ppbV	5	25
1,2-Dichloropropane	ND	ND	ppbV	NC	25
Bromodichloromethane	ND	ND	ppbV	NC	25
Trichloroethene	0.126	0.128	ppbV	2	25
cis-1,3-Dichloropropene	ND	ND	ppbV	NC	25
trans-1,3-Dichloropropene	ND	0.018J	ppbV	NC	25
1,1,2-Trichloroethane	ND	ND	ppbV	NC	25
Toluene	0.211	0.217	ppbV	3	25
Dibromochloromethane	ND	ND	ppbV	NC	25
1,2-Dibromoethane	ND	ND	ppbV	NC	25
Tetrachloroethene	0.307	0.347	ppbV	12	25
1,1,1,2-Tetrachloroethane	ND	ND	ppbV	NC	25
Chlorobenzene	ND	ND	ppbV	NC	25
Ethylbenzene	0.165	0.167	ppbV	1	25
p/m-Xylene	0.658	0.661	ppbV	0	25
Bromoform	ND	ND	ppbV	NC	25
Styrene	0.009J	0.009J	ppbV	NC	25
1,1,2,2-Tetrachloroethane	ND	ND	ppbV	NC	25
o-Xylene	0.341	0.345	ppbV	1	25

Lab Duplicate Analysis
Batch Quality Control

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVER

Lab Number: L1504425
Report Date: 03/25/15

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Volatile Organics in Air by SIM - Mansfield Lab Associated sample(s): 01-11 QC Batch ID: WG767579-5 QC Sample: L1504425-07 Client ID: SG-1					
1,3,5-Trimethybenzene	1.60	1.56	ppbV	3	25
1,2,4-Trimethylbenzene	3.59	3.56	ppbV	1	25
1,3-Dichlorobenzene	ND	ND	ppbV	NC	25
1,4-Dichlorobenzene	0.044	0.043	ppbV	2	25
1,2-Dichlorobenzene	0.032	0.033	ppbV	3	25
1,2,4-Trichlorobenzene	0.014J	0.016J	ppbV	NC	25
Naphthalene	4.75	5.66	ppbV	17	25
Hexachlorobutadiene	ND	ND	ppbV	NC	25

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY
Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID:	L1504425-01	Date Collected:	03/08/15 13:31
Client ID:	OUTDOOR CONTROL	Date Received:	03/10/15
Sample Location:	181 ELLIOT STREET	Field Prep:	Not Specified
Matrix:	Air		
Analytical Method:	96,APH		
Analytical Date:	03/11/15 20:51		
Analyst:	MB		

Quality Control Information

Sample Type:	Composite
Sample Container Type:	Canister -6 Liter
Sampling Flow Controller:	Mechanical
Sampling Zone:	Unknown
Sampling Flow Meter RPD of pre & post-sampling calibration check:	<=20%
Were all QA/QC procedures REQUIRED by the method followed?	Yes
Were all performance/acceptance standards for the required procedures achieved?	Yes
Were significant modifications made to the method as specified in Sect 11.1.2?	No

Petroleum Hydrocarbons in Air - Mansfield Lab

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
1,3-Butadiene	ND		ug/m3	2.0	2.0	1
Methyl tert butyl ether	ND		ug/m3	2.0	2.0	1
Benzene	ND		ug/m3	2.0	2.0	1
C5-C8 Aliphatics, Adjusted	ND		ug/m3	12	12.	1
Toluene	ND		ug/m3	2.0	2.0	1
Ethylbenzene	ND		ug/m3	2.0	2.0	1
p/m-Xylene	ND		ug/m3	4.0	4.0	1
o-Xylene	ND		ug/m3	2.0	2.0	1
Naphthalene	ND		ug/m3	2.0	2.0	1
C9-C12 Aliphatics, Adjusted	ND		ug/m3	14	14.	1
C9-C10 Aromatics Total	ND		ug/m3	10	10.	1

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	83		50-200
Bromochloromethane	87		50-200
Chlorobenzene-d5	88		50-200

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY
Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID:	L1504425-02	Date Collected:	03/08/15 13:23
Client ID:	S-157-J.1	Date Received:	03/10/15
Sample Location:	181 ELLIOT STREET	Field Prep:	Not Specified
Matrix:	Air		
Analytical Method:	96,APH		
Analytical Date:	03/11/15 21:23		
Analyst:	MB		

Quality Control Information

Sample Type:	Composite
Sample Container Type:	Canister - 6 Liter
Sampling Flow Controller:	Mechanical
Sampling Zone:	Unknown
Sampling Flow Meter RPD of pre & post-sampling calibration check:	<=20%
Were all QA/QC procedures REQUIRED by the method followed?	Yes
Were all performance/acceptance standards for the required procedures achieved?	Yes
Were significant modifications made to the method as specified in Sect 11.1.2?	No

Petroleum Hydrocarbons in Air - Mansfield Lab

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
1,3-Butadiene	ND		ug/m3	2.0	2.0	1
Methyl tert butyl ether	ND		ug/m3	2.0	2.0	1
Benzene	ND		ug/m3	2.0	2.0	1
C5-C8 Aliphatics, Adjusted	ND		ug/m3	12	12.	1
Toluene	2.2		ug/m3	2.0	2.0	1
Ethylbenzene	ND		ug/m3	2.0	2.0	1
p/m-Xylene	ND		ug/m3	4.0	4.0	1
o-Xylene	ND		ug/m3	2.0	2.0	1
Naphthalene	ND		ug/m3	2.0	2.0	1
C9-C12 Aliphatics, Adjusted	120		ug/m3	14	14.	1
C9-C10 Aromatics Total	46		ug/m3	10	10.	1

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	86		50-200
Bromochloromethane	91		50-200
Chlorobenzene-d5	92		50-200

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY
Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID:	L1504425-03	Date Collected:	03/08/15 13:22
Client ID:	S-157-J.2	Date Received:	03/10/15
Sample Location:	181 ELLIOT STREET	Field Prep:	Not Specified
Matrix:	Air		
Analytical Method:	96,APH		
Analytical Date:	03/11/15 21:55		
Analyst:	MB		

Quality Control Information

Sample Type:	Composite
Sample Container Type:	Canister - 6 Liter
Sampling Flow Controller:	Mechanical
Sampling Zone:	Unknown
Sampling Flow Meter RPD of pre & post-sampling calibration check:	<=20%
Were all QA/QC procedures REQUIRED by the method followed?	Yes
Were all performance/acceptance standards for the required procedures achieved?	Yes
Were significant modifications made to the method as specified in Sect 11.1.2?	No

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbons in Air - Mansfield Lab						
1,3-Butadiene	ND		ug/m3	2.0	2.0	1
Methyl tert butyl ether	ND		ug/m3	2.0	2.0	1
Benzene	ND		ug/m3	2.0	2.0	1
C5-C8 Aliphatics, Adjusted	14		ug/m3	12	12.	1
Toluene	2.5		ug/m3	2.0	2.0	1
Ethylbenzene	ND		ug/m3	2.0	2.0	1
p/m-Xylene	ND		ug/m3	4.0	4.0	1
o-Xylene	ND		ug/m3	2.0	2.0	1
Naphthalene	ND		ug/m3	2.0	2.0	1
C9-C12 Aliphatics, Adjusted	110		ug/m3	14	14.	1
C9-C10 Aromatics Total	43		ug/m3	10	10.	1

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	83		50-200
Bromochloromethane	87		50-200
Chlorobenzene-d5	96		50-200

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY
Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID:	L1504425-04	Date Collected:	03/08/15 13:24
Client ID:	S-157-J	Date Received:	03/10/15
Sample Location:	181 ELLIOT STREET	Field Prep:	Not Specified
Matrix:	Air		
Analytical Method:	96,APH		
Analytical Date:	03/11/15 22:27		
Analyst:	MB		

Quality Control Information

Sample Type:	Composite
Sample Container Type:	Canister - 6 Liter
Sampling Flow Controller:	Mechanical
Sampling Zone:	Unknown
Sampling Flow Meter RPD of pre & post-sampling calibration check:	<=20%
Were all QA/QC procedures REQUIRED by the method followed?	Yes
Were all performance/acceptance standards for the required procedures achieved?	Yes
Were significant modifications made to the method as specified in Sect 11.1.2?	No

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbons in Air - Mansfield Lab						
1,3-Butadiene	ND		ug/m3	2.0	2.0	1
Methyl tert butyl ether	ND		ug/m3	2.0	2.0	1
Benzene	ND		ug/m3	2.0	2.0	1
C5-C8 Aliphatics, Adjusted	38		ug/m3	12	12.	1
Toluene	3.2		ug/m3	2.0	2.0	1
Ethylbenzene	ND		ug/m3	2.0	2.0	1
p/m-Xylene	ND		ug/m3	4.0	4.0	1
o-Xylene	ND		ug/m3	2.0	2.0	1
Naphthalene	ND		ug/m3	2.0	2.0	1
C9-C12 Aliphatics, Adjusted	130		ug/m3	14	14.	1
C9-C10 Aromatics Total	45		ug/m3	10	10.	1

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	84		50-200
Bromochloromethane	93		50-200
Chlorobenzene-d5	92		50-200

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY
Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID:	L1504425-05	Date Collected:	03/08/15 13:24
Client ID:	DUPLICATE	Date Received:	03/10/15
Sample Location:	181 ELLIOT STREET	Field Prep:	Not Specified
Matrix:	Air		
Analytical Method:	96,APH		
Analytical Date:	03/11/15 22:59		
Analyst:	MB		

Quality Control Information

Sample Type:	Composite
Sample Container Type:	Canister - 6 Liter
Sampling Flow Controller:	Mechanical
Sampling Zone:	Unknown
Sampling Flow Meter RPD of pre & post-sampling calibration check:	<=20%
Were all QA/QC procedures REQUIRED by the method followed?	Yes
Were all performance/acceptance standards for the required procedures achieved?	Yes
Were significant modifications made to the method as specified in Sect 11.1.2?	No

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbons in Air - Mansfield Lab						
1,3-Butadiene	ND		ug/m3	2.0	2.0	1
Methyl tert butyl ether	ND		ug/m3	2.0	2.0	1
Benzene	ND		ug/m3	2.0	2.0	1
C5-C8 Aliphatics, Adjusted	ND		ug/m3	12	12.	1
Toluene	3.3		ug/m3	2.0	2.0	1
Ethylbenzene	ND		ug/m3	2.0	2.0	1
p/m-Xylene	ND		ug/m3	4.0	4.0	1
o-Xylene	ND		ug/m3	2.0	2.0	1
Naphthalene	ND		ug/m3	2.0	2.0	1
C9-C12 Aliphatics, Adjusted	140		ug/m3	14	14.	1
C9-C10 Aromatics Total	51		ug/m3	10	10.	1

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	91		50-200
Bromochloromethane	85		50-200
Chlorobenzene-d5	93		50-200

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY
Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID:	L1504425-06	Date Collected:	03/06/15 00:00
Client ID:	BLANK	Date Received:	03/10/15
Sample Location:	181 ELLIOT STREET	Field Prep:	Not Specified
Matrix:	Air		
Analytical Method:	96,APH		
Analytical Date:	03/11/15 19:46		
Analyst:	MB		

Quality Control Information

Sample Type:	Composite
Sample Container Type:	Canister - 6 Liter
Sampling Flow Controller:	Mechanical
Sampling Zone:	Unknown
Sampling Flow Meter RPD of pre & post-sampling calibration check:	<=20%
Were all QA/QC procedures REQUIRED by the method followed?	Yes
Were all performance/acceptance standards for the required procedures achieved?	Yes
Were significant modifications made to the method as specified in Sect 11.1.2?	No

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbons in Air - Mansfield Lab						
1,3-Butadiene	ND		ug/m3	2.0	2.0	1
Methyl tert butyl ether	ND		ug/m3	2.0	2.0	1
Benzene	ND		ug/m3	2.0	2.0	1
C5-C8 Aliphatics, Adjusted	ND		ug/m3	12	12.	1
Toluene	ND		ug/m3	2.0	2.0	1
Ethylbenzene	ND		ug/m3	2.0	2.0	1
p/m-Xylene	ND		ug/m3	4.0	4.0	1
o-Xylene	ND		ug/m3	2.0	2.0	1
Naphthalene	ND		ug/m3	2.0	2.0	1
C9-C12 Aliphatics, Adjusted	ND		ug/m3	14	14.	1
C9-C10 Aromatics Total	ND		ug/m3	10	10.	1

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	86		50-200
Bromochloromethane	90		50-200
Chlorobenzene-d5	92		50-200

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY
Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID:	L1504425-07	Date Collected:	03/06/15 19:43
Client ID:	SG-1	Date Received:	03/10/15
Sample Location:	181 ELLIOT STREET	Field Prep:	Not Specified
Matrix:	Soil_Vapor		
Analytical Method:	96,APH		
Analytical Date:	03/11/15 23:31		
Analyst:	MB		

Quality Control Information

Sample Type:	Composite
Sample Container Type:	Canister - 2.7 Liter
Sampling Flow Controller:	Mechanical
Sampling Zone:	Unknown
Sampling Flow Meter RPD of pre & post-sampling calibration check:	<=20%
Were all QA/QC procedures REQUIRED by the method followed?	Yes
Were all performance/acceptance standards for the required procedures achieved?	Yes
Were significant modifications made to the method as specified in Sect 11.1.2?	No

Petroleum Hydrocarbons in Air - Mansfield Lab

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
1,3-Butadiene	ND		ug/m3	2.0	2.0	1
Methyl tert butyl ether	ND		ug/m3	2.0	2.0	1
Benzene	ND		ug/m3	2.0	2.0	1
C5-C8 Aliphatics, Adjusted	50		ug/m3	12	12.	1
Toluene	ND		ug/m3	2.0	2.0	1
Ethylbenzene	ND		ug/m3	2.0	2.0	1
p/m-Xylene	ND		ug/m3	4.0	4.0	1
o-Xylene	ND		ug/m3	2.0	2.0	1
Naphthalene	28		ug/m3	2.0	2.0	1
C9-C12 Aliphatics, Adjusted	1900		ug/m3	14	14.	1
C9-C10 Aromatics Total	340		ug/m3	10	10.	1

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	82		50-200
Bromochloromethane	84		50-200
Chlorobenzene-d5	93		50-200

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY
Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID:	L1504425-08	Date Collected:	03/06/15 18:51
Client ID:	SG-2	Date Received:	03/10/15
Sample Location:	181 ELLIOT STREET	Field Prep:	Not Specified
Matrix:	Soil_Vapor		
Analytical Method:	96,APH		
Analytical Date:	03/12/15 08:45		
Analyst:	MB		

Quality Control Information

Sample Type:	Composite
Sample Container Type:	Canister - 2.7 Liter
Sampling Flow Controller:	Mechanical
Sampling Zone:	Unknown
Sampling Flow Meter RPD of pre & post-sampling calibration check:	<=20%
Were all QA/QC procedures REQUIRED by the method followed?	Yes
Were all performance/acceptance standards for the required procedures achieved?	Yes
Were significant modifications made to the method as specified in Sect 11.1.2?	No

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbons in Air - Mansfield Lab						
1,3-Butadiene	ND		ug/m3	2.0	2.0	1
Methyl tert butyl ether	ND		ug/m3	2.0	2.0	1
Benzene	ND		ug/m3	2.0	2.0	1
C5-C8 Aliphatics, Adjusted	48		ug/m3	12	12.	1
Toluene	ND		ug/m3	2.0	2.0	1
Ethylbenzene	ND		ug/m3	2.0	2.0	1
p/m-Xylene	ND		ug/m3	4.0	4.0	1
o-Xylene	ND		ug/m3	2.0	2.0	1
Naphthalene	ND		ug/m3	2.0	2.0	1
C9-C12 Aliphatics, Adjusted	30		ug/m3	14	14.	1
C9-C10 Aromatics Total	ND		ug/m3	10	10.	1

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	84		50-200
Bromochloromethane	88		50-200
Chlorobenzene-d5	95		50-200

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY
Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID:	L1504425-09	Date Collected:	03/06/15 19:31
Client ID:	SG-3	Date Received:	03/10/15
Sample Location:	181 ELLIOT STREET	Field Prep:	Not Specified
Matrix:	Soil_Vapor		
Analytical Method:	96,APH		
Analytical Date:	03/12/15 01:08		
Analyst:	MB		

Quality Control Information

Sample Type:	Composite
Sample Container Type:	Canister - 2.7 Liter
Sampling Flow Controller:	Mechanical
Sampling Zone:	Unknown
Sampling Flow Meter RPD of pre & post-sampling calibration check:	<=20%
Were all QA/QC procedures REQUIRED by the method followed?	Yes
Were all performance/acceptance standards for the required procedures achieved?	Yes
Were significant modifications made to the method as specified in Sect 11.1.2?	No

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbons in Air - Mansfield Lab						
1,3-Butadiene	ND		ug/m3	2.0	2.0	1
Methyl tert butyl ether	ND		ug/m3	2.0	2.0	1
Benzene	ND		ug/m3	2.0	2.0	1
C5-C8 Aliphatics, Adjusted	15		ug/m3	12	12.	1
Toluene	ND		ug/m3	2.0	2.0	1
Ethylbenzene	ND		ug/m3	2.0	2.0	1
p/m-Xylene	ND		ug/m3	4.0	4.0	1
o-Xylene	ND		ug/m3	2.0	2.0	1
Naphthalene	ND		ug/m3	2.0	2.0	1
C9-C12 Aliphatics, Adjusted	54		ug/m3	14	14.	1
C9-C10 Aromatics Total	ND		ug/m3	10	10.	1

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	86		50-200
Bromochloromethane	92		50-200
Chlorobenzene-d5	97		50-200

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY
Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID:	L1504425-10	Date Collected:	03/06/15 20:02
Client ID:	SG-4	Date Received:	03/10/15
Sample Location:	181 ELLIOT STREET	Field Prep:	Not Specified
Matrix:	Soil_Vapor		
Analytical Method:	96,APH		
Analytical Date:	03/12/15 01:40		
Analyst:	MB		

Quality Control Information

Sample Type:	Composite
Sample Container Type:	Canister - 2.7 Liter
Sampling Flow Controller:	Mechanical
Sampling Zone:	Unknown
Sampling Flow Meter RPD of pre & post-sampling calibration check:	<=20%
Were all QA/QC procedures REQUIRED by the method followed?	Yes
Were all performance/acceptance standards for the required procedures achieved?	Yes
Were significant modifications made to the method as specified in Sect 11.1.2?	No

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbons in Air - Mansfield Lab						
1,3-Butadiene	ND		ug/m3	2.0	2.0	1
Methyl tert butyl ether	ND		ug/m3	2.0	2.0	1
Benzene	3.1		ug/m3	2.0	2.0	1
C5-C8 Aliphatics, Adjusted	1100		ug/m3	12	12.	1
Toluene	ND		ug/m3	2.0	2.0	1
Ethylbenzene	ND		ug/m3	2.0	2.0	1
p/m-Xylene	ND		ug/m3	4.0	4.0	1
o-Xylene	2.8		ug/m3	2.0	2.0	1
Naphthalene	ND		ug/m3	2.0	2.0	1
C9-C12 Aliphatics, Adjusted	3700		ug/m3	14	14.	1
C9-C10 Aromatics Total	11		ug/m3	10	10.	1

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	87		50-200
Bromochloromethane	92		50-200
Chlorobenzene-d5	100		50-200

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY
Lab Number: L1504425
Report Date: 03/25/15

SAMPLE RESULTS

Lab ID:	L1504425-11	Date Collected:	03/06/15 00:00
Client ID:	SG BLANK	Date Received:	03/10/15
Sample Location:	181 ELLIOT STREET	Field Prep:	Not Specified
Matrix:	Soil_Vapor		
Analytical Method:	96,APH		
Analytical Date:	03/11/15 20:19		
Analyst:	MB		

Quality Control Information

Sample Type:	Composite
Sample Container Type:	Canister - 2.7 Liter
Sampling Flow Controller:	Mechanical
Sampling Zone:	Unknown
Sampling Flow Meter RPD of pre & post-sampling calibration check:	<=20%
Were all QA/QC procedures REQUIRED by the method followed?	Yes
Were all performance/acceptance standards for the required procedures achieved?	Yes
Were significant modifications made to the method as specified in Sect 11.1.2?	No

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbons in Air - Mansfield Lab						
1,3-Butadiene	ND		ug/m3	2.0	2.0	1
Methyl tert butyl ether	ND		ug/m3	2.0	2.0	1
Benzene	ND		ug/m3	2.0	2.0	1
C5-C8 Aliphatics, Adjusted	ND		ug/m3	12	12.	1
Toluene	ND		ug/m3	2.0	2.0	1
Ethylbenzene	ND		ug/m3	2.0	2.0	1
p/m-Xylene	ND		ug/m3	4.0	4.0	1
o-Xylene	ND		ug/m3	2.0	2.0	1
Naphthalene	ND		ug/m3	2.0	2.0	1
C9-C12 Aliphatics, Adjusted	ND		ug/m3	14	14.	1
C9-C10 Aromatics Total	ND		ug/m3	10	10.	1

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	95		50-200
Bromochloromethane	95		50-200
Chlorobenzene-d5	97		50-200

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY
Lab Number: L1504425
Report Date: 03/25/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 96,APH
Analytical Date: 03/11/15 13:49
Analyst: MB

Parameter	Result	Qualifier	Units	RL	MDL
Petroleum Hydrocarbons in Air - Mansfield Lab for sample(s): 01-11 Batch: WG767580-4					
1,3-Butadiene	ND		ug/m3	2.0	2.0
Methyl tert butyl ether	ND		ug/m3	2.0	2.0
Benzene	ND		ug/m3	2.0	2.0
C5-C8 Aliphatics, Adjusted	ND		ug/m3	12	12.
Toluene	ND		ug/m3	2.0	2.0
Ethylbenzene	ND		ug/m3	2.0	2.0
p/m-Xylene	ND		ug/m3	4.0	4.0
o-Xylene	ND		ug/m3	2.0	2.0
Naphthalene	ND		ug/m3	2.0	2.0
C9-C12 Aliphatics, Adjusted	ND		ug/m3	14	14.
C9-C10 Aromatics Total	ND		ug/m3	10	10.

Lab Control Sample Analysis

Batch Quality Control

Project Name: CUMMINGS BEVERLY

Project Number: CUMMINGS BEVERLY

Lab Number: L1504425

Report Date: 03/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Petroleum Hydrocarbons in Air - Mansfield Lab Associated sample(s): 01-11 Batch: WG767580-3								
1,3-Butadiene	98		-		70-130	-		
Methyl tert butyl ether	90		-		70-130	-		
Benzene	99		-		70-130	-		
C5-C8 Aliphatics, Adjusted	94		-		70-130	-		
Toluene	95		-		70-130	-		
Ethylbenzene	93		-		70-130	-		
p/m-Xylene	94		-		70-130	-		
o-Xylene	97		-		70-130	-		
Naphthalene	106		-		50-150	-		
C9-C12 Aliphatics, Adjusted	93		-		70-130	-		
C9-C10 Aromatics Total	81		-		70-130	-		

Lab Duplicate Analysis
Batch Quality Control

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVER

Lab Number: L1504425
Report Date: 03/25/15

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Petroleum Hydrocarbons in Air - Mansfield Lab Associated sample(s): 01-11 QC Batch ID: WG767580-5 QC Sample: L1504425-07 Client ID: SG-1						
1,3-Butadiene	ND	ND	ug/m3	NC		30
Methyl tert butyl ether	ND	ND	ug/m3	NC		30
Benzene	ND	ND	ug/m3	NC		30
C5-C8 Aliphatics, Adjusted	50	50	ug/m3	0		30
Toluene	ND	ND	ug/m3	NC		30
Ethylbenzene	ND	ND	ug/m3	NC		30
p/m-Xylene	ND	ND	ug/m3	NC		30
o-Xylene	ND	ND	ug/m3	NC		30
Naphthalene	28	35	ug/m3	22		30
C9-C12 Aliphatics, Adjusted	1900	2100	ug/m3	10		30
C9-C10 Aromatics Total	340	380	ug/m3	11		30

Project Name: CUMMINGS BEVERLY

Project Number: CUMMINGS BEVERLY

Lab Number: L1504425

Report Date: 03/25/15

Canister and Flow Controller Information

Samplenum	Client ID	Media ID	Media Type	Date Prepared	Bottle Order	Cleaning Batch ID	Can Leak Check	Initial Pressure (in. Hg)	Pressure on Receipt (in. Hg)	Flow Controler Leak Chk	Flow Out mL/min	Flow In mL/min	% RPD
L1504425-01	OUTDOOR CONTROL	0102	#16 SV	02/24/15	200169		-	-	-	Pass	3.0	3.0	0
L1504425-01	OUTDOOR CONTROL	1889	6.0L Can	02/24/15	200169	L1503156-01	Pass	-28.0	2.5	-	-	-	-
L1504425-02	S-157-J.1	0114	#16 AMB	02/24/15	200169		-	-	-	Pass	3.2	3.1	3
L1504425-02	S-157-J.1	1662	6.0L Can	02/24/15	200169	L1503156-02	Pass	-29.9	1.0	-	-	-	-
L1504425-03	S-157-J.2	0285	#16 AMB	02/24/15	200169		-	-	-	Pass	3.0	2.7	11
L1504425-03	S-157-J.2	985	6.0L Can	02/24/15	200169	L1503156-02	Pass	-29.7	0.9	-	-	-	-
L1504425-04	S-157-J	0354	#16 AMB	02/24/15	200169		-	-	-	Pass	3.2	3.0	6
L1504425-04	S-157-J	1598	6.0L Can	02/24/15	200169	L1503156-02	Pass	-28.8	1.0	-	-	-	-
L1504425-05	DUPLICATE	0243	#16 AMB	02/24/15	200169		-	-	-	Pass	3.0	3.2	6
L1504425-05	DUPLICATE	1794	6.0L Can	02/24/15	200169	L1503156-02	Pass	-29.7	1.1	-	-	-	-
L1504425-06	BLANK	0551	#16 AMB	02/24/15	200169		-	-	-	Pass	3.1	3.0	3
L1504425-06	BLANK	1050	6.0L Can	02/24/15	200169	L1503156-01	Pass	-28.0	-29.5	-	-	-	-
L1504425-07	SG-1	0309	#90 SV	02/24/15	200169		-	-	-	Pass	70	79	12
L1504425-07	SG-1	259	2.7L Can	02/24/15	200169	L1502909-01	Pass	-28.0	1.1	-	-	-	-
L1504425-08	SG-2	0342	#90 SV	02/24/15	200169		-	-	-	Pass	72	87	19

Project Name: CUMMINGS BEVERLY

Project Number: CUMMINGS BEVERLY

Lab Number: L1504425

Report Date: 03/25/15

Canister and Flow Controller Information

Samplenum	Client ID	Media ID	Media Type	Date Prepared	Bottle Order	Cleaning Batch ID	Can Leak Check	Initial Pressure (in. Hg)	Pressure on Receipt (in. Hg)	Flow Controler Leak Chk	Flow Out mL/min	Flow In mL/min	% RPD
L1504425-08	SG-2	1748	2.7L Can	02/24/15	200169	L1502909-01	Pass	-28.0	0.9	-	-	-	-
L1504425-09	SG-3	0389	#90 SV	02/24/15	200169		-	-	-	Pass	70	79	12
L1504425-09	SG-3	383	2.7L Can	02/24/15	200169	L1502909-01	Pass	-28.0	1.3	-	-	-	-
L1504425-10	SG-4	0259	#90 SV	02/24/15	200169		-	-	-	Pass	72	73	1
L1504425-10	SG-4	2015	2.7L Can	02/24/15	200169	L1502909-01	Pass	-29.9	0.6	-	-	-	-
L1504425-11	SG BLANK	0182	#90 SV	02/24/15	200169		-	-	-	Pass	67	77	14
L1504425-11	SG BLANK	1744	2.7L Can	02/24/15	200169	L1502909-01	Pass	-28.0	-28.8	-	-	-	-

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1502909
Report Date: 03/25/15

Air Canister Certification Results

Lab ID: L1502909-01
Client ID: CAN 125 SHELF 15
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 02/14/15 15:31
Analyst: RY

Date Collected: 02/13/15 17:30
Date Received: 02/14/15
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air - Mansfield Lab								
Chlorodifluoromethane	ND	0.200	0.063	ND	0.707	0.221		1
Propylene	ND	0.500	0.093	ND	0.861	0.160		1
Propane	ND	0.500	0.114	ND	0.902	0.206		1
Dichlorodifluoromethane	ND	0.200	0.047	ND	0.989	0.230		1
Chloromethane	ND	0.200	0.096	ND	0.413	0.198		1
Freon-114	ND	0.200	0.042	ND	1.40	0.293		1
Methanol	ND	5.00	0.736	ND	6.55	0.964		1
Vinyl chloride	ND	0.200	0.053	ND	0.511	0.136		1
1,3-Butadiene	ND	0.200	0.080	ND	0.442	0.177		1
Butane	ND	0.200	0.044	ND	0.475	0.105		1
Bromomethane	ND	0.200	0.070	ND	0.777	0.270		1
Chloroethane	ND	0.200	0.077	ND	0.528	0.202		1
Ethanol	ND	2.50	0.542	ND	4.71	1.02		1
Dichlorofluoromethane	ND	0.200	0.057	ND	0.842	0.241		1
Vinyl bromide	ND	0.200	0.070	ND	0.874	0.306		1
Acrolein	ND	0.500	0.114	ND	1.15	0.261		1
Acetone	ND	1.00	0.269	ND	2.38	0.639		1
Acetonitrile	ND	0.200	0.076	ND	0.336	0.128		1
Trichlorofluoromethane	ND	0.200	0.042	ND	1.12	0.234		1
Isopropanol	ND	0.500	0.114	ND	1.23	0.280		1
Acrylonitrile	ND	0.500	0.079	ND	1.09	0.171		1
Pentane	ND	0.200	0.048	ND	0.590	0.140		1
Ethyl ether	ND	0.200	0.059	ND	0.606	0.179		1
1,1-Dichloroethene	ND	0.200	0.057	ND	0.793	0.224		1
Tertiary butyl Alcohol	ND	0.500	0.060	ND	1.52	0.182		1

Project Name: BATCH CANISTER CERTIFICATION **Lab Number:** L1502909

Project Number: CANISTER QC BAT **Report Date:** 03/25/15

Air Canister Certification Results

Lab ID: L1502909-01 Date Collected: 02/13/15 17:30

Client ID: CAN 125 SHELF 15 Date Received: 02/14/15

Sample Location: Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Methylene chloride	ND	0.500	0.188	ND	1.74	0.653		1
3-Chloropropene	ND	0.200	0.081	ND	0.626	0.254		1
Carbon disulfide	ND	0.200	0.035	ND	0.623	0.107		1
Freon-113	ND	0.200	0.051	ND	1.53	0.392		1
trans-1,2-Dichloroethene	ND	0.200	0.074	ND	0.793	0.293		1
1,1-Dichloroethane	ND	0.200	0.077	ND	0.809	0.312		1
Methyl tert butyl ether	ND	0.200	0.045	ND	0.721	0.163		1
Vinyl acetate	ND	0.200	0.057	ND	0.704	0.200		1
2-Butanone	ND	0.500	0.052	ND	1.47	0.154		1
cis-1,2-Dichloroethene	ND	0.200	0.059	ND	0.793	0.233		1
Ethyl Acetate	ND	0.500	0.131	ND	1.80	0.472		1
Chloroform	ND	0.200	0.045	ND	0.977	0.221		1
Tetrahydrofuran	ND	0.500	0.062	ND	1.47	0.183		1
2,2-Dichloropropane	ND	0.200	0.058	ND	0.924	0.269		1
1,2-Dichloroethane	ND	0.200	0.055	ND	0.809	0.223		1
n-Hexane	ND	0.200	0.052	ND	0.705	0.183		1
Diisopropyl ether	ND	0.200	0.066	ND	0.836	0.274		1
tert-Butyl Ethyl Ether	ND	0.200	0.052	ND	0.836	0.215		1
1,1,1-Trichloroethane	ND	0.200	0.057	ND	1.09	0.311		1
1,1-Dichloropropene	ND	0.200	0.072	ND	0.908	0.325		1
Benzene	ND	0.200	0.054	ND	0.639	0.172		1
Carbon tetrachloride	ND	0.200	0.047	ND	1.26	0.296		1
Cyclohexane	ND	0.200	0.066	ND	0.688	0.226		1
tert-Amyl Methyl Ether	ND	0.200	0.080	ND	0.836	0.332		1
Dibromomethane	ND	0.200	0.048	ND	1.42	0.338		1
1,2-Dichloropropane	ND	0.200	0.070	ND	0.924	0.322		1
Bromodichloromethane	ND	0.200	0.066	ND	1.34	0.439		1
1,4-Dioxane	ND	0.200	0.078	ND	0.721	0.281		1

Project Name: BATCH CANISTER CERTIFICATION **Lab Number:** L1502909

Project Number: CANISTER QC BAT **Report Date:** 03/25/15

Air Canister Certification Results

Lab ID: L1502909-01 Date Collected: 02/13/15 17:30

Client ID: CAN 125 SHELF 15 Date Received: 02/14/15

Sample Location: Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Trichloroethene	ND	0.200	0.071	ND	1.07	0.382		1
2,2,4-Trimethylpentane	ND	0.200	0.066	ND	0.934	0.308		1
Methyl Methacrylate	ND	0.500	0.148	ND	2.05	0.606		1
Heptane	ND	0.200	0.055	ND	0.820	0.227		1
cis-1,3-Dichloropropene	ND	0.200	0.075	ND	0.908	0.338		1
4-Methyl-2-pentanone	ND	0.500	0.061	ND	2.05	0.249		1
trans-1,3-Dichloropropene	ND	0.200	0.069	ND	0.908	0.315		1
1,1,2-Trichloroethane	ND	0.200	0.067	ND	1.09	0.364		1
Toluene	ND	0.200	0.063	ND	0.754	0.237		1
1,3-Dichloropropane	ND	0.200	0.078	ND	0.924	0.359		1
2-Hexanone	ND	0.200	0.060	ND	0.820	0.248		1
Dibromochloromethane	ND	0.200	0.075	ND	1.70	0.636		1
1,2-Dibromoethane	ND	0.200	0.078	ND	1.54	0.599		1
Butyl acetate	ND	0.500	0.114	ND	2.38	0.542		1
Octane	ND	0.200	0.042	ND	0.934	0.197		1
Tetrachloroethene	ND	0.200	0.076	ND	1.36	0.514		1
1,1,1,2-Tetrachloroethane	ND	0.200	0.055	ND	1.37	0.376		1
Chlorobenzene	ND	0.200	0.079	ND	0.921	0.363		1
Ethylbenzene	ND	0.200	0.056	ND	0.869	0.241		1
p/m-Xylene	ND	0.400	0.139	ND	1.74	0.604		1
Bromoform	ND	0.200	0.052	ND	2.07	0.541		1
Styrene	ND	0.200	0.080	ND	0.852	0.340		1
1,1,2,2-Tetrachloroethane	ND	0.200	0.055	ND	1.37	0.376		1
o-Xylene	ND	0.200	0.063	ND	0.869	0.274		1
1,2,3-Trichloropropane	ND	0.200	0.077	ND	1.21	0.462		1
Nonane	ND	0.200	0.064	ND	1.05	0.338		1
Isopropylbenzene	ND	0.200	0.043	ND	0.983	0.211		1
Bromobenzene	ND	0.200	0.079	ND	0.793	0.313		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1502909
Report Date: 03/25/15

Air Canister Certification Results

Lab ID: L1502909-01
Client ID: CAN 125 SHELF 15
Sample Location:
Date Collected: 02/13/15 17:30
Date Received: 02/14/15
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
2-Chlorotoluene	ND	0.200	0.049	ND	1.04	0.252		1
n-Propylbenzene	ND	0.200	0.056	ND	0.983	0.275		1
4-Chlorotoluene	ND	0.200	0.076	ND	1.04	0.396		1
4-Ethyltoluene	ND	0.200	0.078	ND	0.983	0.381		1
1,3,5-Trimethylbenzene	ND	0.200	0.058	ND	0.983	0.287		1
tert-Butylbenzene	ND	0.200	0.040	ND	1.10	0.221		1
1,2,4-Trimethylbenzene	ND	0.200	0.069	ND	0.983	0.341		1
Decane	ND	0.200	0.048	ND	1.16	0.282		1
Benzyl chloride	ND	0.200	0.065	ND	1.04	0.334		1
1,3-Dichlorobenzene	ND	0.200	0.064	ND	1.20	0.383		1
1,4-Dichlorobenzene	ND	0.200	0.042	ND	1.20	0.251		1
sec-Butylbenzene	ND	0.200	0.073	ND	1.10	0.401		1
p-Isopropyltoluene	ND	0.200	0.061	ND	1.10	0.334		1
1,2-Dichlorobenzene	ND	0.200	0.061	ND	1.20	0.369		1
n-Butylbenzene	ND	0.200	0.064	ND	1.10	0.351		1
1,2-Dibromo-3-chloropropane	ND	0.200	0.074	ND	1.93	0.719		1
Undecane	ND	0.200	0.053	ND	1.28	0.338		1
Dodecane	ND	0.200	0.056	ND	1.39	0.393		1
1,2,4-Trichlorobenzene	ND	0.200	0.061	ND	1.48	0.454		1
Naphthalene	ND	0.200	0.043	ND	1.05	0.227		1
1,2,3-Trichlorobenzene	ND	0.200	0.044	ND	1.48	0.324		1
Hexachlorobutadiene	ND	0.200	0.073	ND	2.13	0.781		1

	Results	**Qualifier**	**Units**	**RDL**	**Dilution Factor**
Tentatively Identified Compounds					

No Tentatively Identified Compounds

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1502909
Report Date: 03/25/15

Air Canister Certification Results

Lab ID: L1502909-01
Client ID: CAN 125 SHELF 15
Sample Location:
Date Collected: 02/13/15 17:30
Date Received: 02/14/15
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air - Mansfield Lab								

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	107		60-140
Bromochloromethane	101		60-140
chlorobenzene-d5	100		60-140

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1502909
Report Date: 03/25/15

Air Canister Certification Results

Lab ID: L1502909-01
Client ID: CAN 125 SHELF 15
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 02/14/15 15:31
Analyst: RY

Date Collected: 02/13/15 17:30
Date Received: 02/14/15
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air by SIM - Mansfield Lab								
Dichlorodifluoromethane	ND	0.050	0.006	ND	0.247	0.030		1
Chloromethane	ND	0.500	0.048	ND	1.03	0.099		1
Freon-114	ND	0.050	0.005	ND	0.349	0.035		1
Vinyl chloride	ND	0.020	0.007	ND	0.051	0.018		1
1,3-Butadiene	ND	0.020	0.006	ND	0.044	0.013		1
Bromomethane	ND	0.020	0.008	ND	0.078	0.031		1
Chloroethane	ND	0.020	0.007	ND	0.053	0.019		1
Acetone	ND	2.00	0.739	ND	4.75	1.76		1
Trichlorofluoromethane	ND	0.050	0.008	ND	0.281	0.045		1
Acrylonitrile	ND	0.500	0.015	ND	1.09	0.033		1
1,1-Dichloroethene	ND	0.020	0.007	ND	0.079	0.028		1
Methylene chloride	ND	1.00	0.250	ND	3.47	0.869		1
Freon-113	ND	0.050	0.006	ND	0.383	0.046		1
Halothane	ND	0.050	0.008	ND	0.404	0.065		1
trans-1,2-Dichloroethene	ND	0.020	0.006	ND	0.079	0.024		1
1,1-Dichloroethane	ND	0.020	0.007	ND	0.081	0.028		1
Methyl tert butyl ether	ND	0.020	0.004	ND	0.072	0.014		1
2-Butanone	ND	0.500	0.025	ND	1.47	0.073		1
cis-1,2-Dichloroethene	ND	0.020	0.007	ND	0.079	0.026		1
Chloroform	ND	0.020	0.006	ND	0.098	0.029		1
1,2-Dichloroethane	ND	0.020	0.008	ND	0.081	0.032		1
1,1,1-Trichloroethane	ND	0.020	0.007	ND	0.109	0.038		1
Benzene	ND	0.100	0.021	ND	0.319	0.067		1
Carbon tetrachloride	ND	0.020	0.008	ND	0.126	0.050		1
1,2-Dichloropropane	ND	0.020	0.006	ND	0.092	0.028		1

Project Name: BATCH CANISTER CERTIFICATION **Lab Number:** L1502909

Project Number: CANISTER QC BAT **Report Date:** 03/25/15

Air Canister Certification Results

Lab ID: L1502909-01 Date Collected: 02/13/15 17:30

Client ID: CAN 125 SHELF 15 Date Received: 02/14/15

Sample Location: Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air by SIM - Mansfield Lab								
Bromodichloromethane	ND	0.020	0.008	ND	0.134	0.054		1
1,4-Dioxane	ND	0.100	0.050	ND	0.360	0.180		1
Trichloroethene	ND	0.020	0.007	ND	0.107	0.038		1
cis-1,3-Dichloropropene	ND	0.020	0.008	ND	0.091	0.036		1
4-Methyl-2-pentanone	ND	0.500	0.042	ND	2.05	0.172		1
trans-1,3-Dichloropropene	ND	0.020	0.008	ND	0.091	0.036		1
1,1,2-Trichloroethane	ND	0.020	0.009	ND	0.109	0.049		1
Toluene	ND	0.050	0.025	ND	0.188	0.094		1
Dibromochloromethane	ND	0.020	0.008	ND	0.170	0.068		1
1,2-Dibromoethane	ND	0.020	0.008	ND	0.154	0.062		1
Tetrachloroethene	ND	0.020	0.008	ND	0.136	0.054		1
1,1,1,2-Tetrachloroethane	ND	0.020	0.004	ND	0.137	0.028		1
Chlorobenzene	ND	0.020	0.008	ND	0.092	0.037		1
Ethylbenzene	ND	0.020	0.007	ND	0.087	0.030		1
p/m-Xylene	ND	0.040	0.009	ND	0.174	0.039		1
Bromoform	ND	0.020	0.015	ND	0.207	0.155		1
Styrene	ND	0.020	0.008	ND	0.085	0.034		1
1,1,2,2-Tetrachloroethane	ND	0.020	0.007	ND	0.137	0.048		1
o-Xylene	ND	0.020	0.008	ND	0.087	0.035		1
Isopropylbenzene	ND	0.500	0.046	ND	2.46	0.226		1
4-Ethyltoluene	ND	0.020	0.010	ND	0.098	0.048		1
1,3,5-Trimethybenzene	ND	0.020	0.005	ND	0.098	0.025		1
1,2,4-Trimethylbenzene	ND	0.020	0.007	ND	0.098	0.034		1
1,3-Dichlorobenzene	ND	0.020	0.007	ND	0.120	0.042		1
1,4-Dichlorobenzene	ND	0.020	0.008	ND	0.120	0.048		1
sec-Butylbenzene	ND	0.500	0.047	ND	2.74	0.258		1
p-Isopropyltoluene	ND	0.500	0.048	ND	2.74	0.263		1
1,2-Dichlorobenzene	ND	0.020	0.007	ND	0.120	0.042		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1502909
Report Date: 03/25/15

Air Canister Certification Results

Lab ID: L1502909-01
Client ID: CAN 125 SHELF 15
Sample Location:
Date Collected: 02/13/15 17:30
Date Received: 02/14/15
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air by SIM - Mansfield Lab								
n-Butylbenzene	ND	0.500	0.045	ND	2.74	0.247		1
1,2,4-Trichlorobenzene	ND	0.050	0.010	ND	0.371	0.074		1
Naphthalene	ND	0.050	0.012	ND	0.262	0.063		1
1,2,3-Trichlorobenzene	ND	0.050	0.019	ND	0.371	0.141		1
Hexachlorobutadiene	ND	0.050	0.011	ND	0.533	0.117		1

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-difluorobenzene	106		60-140
bromochloromethane	100		60-140
chlorobenzene-d5	98		60-140

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1503156
Report Date: 03/25/15

Air Canister Certification Results

Lab ID: L1503156-01
Client ID: CAN 771 SHELF 56
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 02/19/15 17:31
Analyst: RY

Date Collected: 02/19/15 09:00
Date Received: 02/19/15
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air - Mansfield Lab								
Chlorodifluoromethane	ND	0.200	0.063	ND	0.707	0.221		1
Propylene	ND	0.500	0.093	ND	0.861	0.160		1
Propane	ND	0.500	0.114	ND	0.902	0.206		1
Dichlorodifluoromethane	ND	0.200	0.047	ND	0.989	0.230		1
Chloromethane	ND	0.200	0.096	ND	0.413	0.198		1
Freon-114	ND	0.200	0.042	ND	1.40	0.293		1
Methanol	ND	5.00	0.736	ND	6.55	0.964		1
Vinyl chloride	ND	0.200	0.053	ND	0.511	0.136		1
1,3-Butadiene	ND	0.200	0.080	ND	0.442	0.177		1
Butane	ND	0.200	0.044	ND	0.475	0.105		1
Bromomethane	ND	0.200	0.070	ND	0.777	0.270		1
Chloroethane	ND	0.200	0.077	ND	0.528	0.202		1
Ethanol	ND	2.50	0.542	ND	4.71	1.02		1
Dichlorofluoromethane	ND	0.200	0.057	ND	0.842	0.241		1
Vinyl bromide	ND	0.200	0.070	ND	0.874	0.306		1
Acrolein	ND	0.500	0.114	ND	1.15	0.261		1
Acetone	ND	1.00	0.269	ND	2.38	0.639		1
Acetonitrile	ND	0.200	0.076	ND	0.336	0.128		1
Trichlorofluoromethane	ND	0.200	0.042	ND	1.12	0.234		1
Isopropanol	ND	0.500	0.114	ND	1.23	0.280		1
Acrylonitrile	ND	0.500	0.079	ND	1.09	0.171		1
Pentane	ND	0.200	0.048	ND	0.590	0.140		1
Ethyl ether	ND	0.200	0.059	ND	0.606	0.179		1
1,1-Dichloroethene	ND	0.200	0.057	ND	0.793	0.224		1
Tertiary butyl Alcohol	ND	0.500	0.060	ND	1.52	0.182		1

Project Name: BATCH CANISTER CERTIFICATION **Lab Number:** L1503156

Project Number: CANISTER QC BAT **Report Date:** 03/25/15

Air Canister Certification Results

Lab ID: L1503156-01 Date Collected: 02/19/15 09:00

Client ID: CAN 771 SHELF 56 Date Received: 02/19/15

Sample Location: Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Methylene chloride	ND	0.500	0.188	ND	1.74	0.653		1
3-Chloropropene	ND	0.200	0.081	ND	0.626	0.254		1
Carbon disulfide	ND	0.200	0.035	ND	0.623	0.107		1
Freon-113	ND	0.200	0.051	ND	1.53	0.392		1
trans-1,2-Dichloroethene	ND	0.200	0.074	ND	0.793	0.293		1
1,1-Dichloroethane	ND	0.200	0.077	ND	0.809	0.312		1
Methyl tert butyl ether	ND	0.200	0.045	ND	0.721	0.163		1
Vinyl acetate	ND	0.200	0.057	ND	0.704	0.200		1
2-Butanone	ND	0.500	0.052	ND	1.47	0.154		1
cis-1,2-Dichloroethene	ND	0.200	0.059	ND	0.793	0.233		1
Ethyl Acetate	ND	0.500	0.131	ND	1.80	0.472		1
Chloroform	ND	0.200	0.045	ND	0.977	0.221		1
Tetrahydrofuran	ND	0.500	0.062	ND	1.47	0.183		1
2,2-Dichloropropane	ND	0.200	0.058	ND	0.924	0.269		1
1,2-Dichloroethane	ND	0.200	0.055	ND	0.809	0.223		1
n-Hexane	ND	0.200	0.052	ND	0.705	0.183		1
Diisopropyl ether	ND	0.200	0.066	ND	0.836	0.274		1
tert-Butyl Ethyl Ether	ND	0.200	0.052	ND	0.836	0.215		1
1,1,1-Trichloroethane	ND	0.200	0.057	ND	1.09	0.311		1
1,1-Dichloropropene	ND	0.200	0.072	ND	0.908	0.325		1
Benzene	ND	0.200	0.054	ND	0.639	0.172		1
Carbon tetrachloride	ND	0.200	0.047	ND	1.26	0.296		1
Cyclohexane	ND	0.200	0.066	ND	0.688	0.226		1
tert-Amyl Methyl Ether	ND	0.200	0.080	ND	0.836	0.332		1
Dibromomethane	ND	0.200	0.048	ND	1.42	0.338		1
1,2-Dichloropropane	ND	0.200	0.070	ND	0.924	0.322		1
Bromodichloromethane	ND	0.200	0.066	ND	1.34	0.439		1
1,4-Dioxane	ND	0.200	0.078	ND	0.721	0.281		1

Project Name: BATCH CANISTER CERTIFICATION **Lab Number:** L1503156

Project Number: CANISTER QC BAT **Report Date:** 03/25/15

Air Canister Certification Results

Lab ID: L1503156-01 Date Collected: 02/19/15 09:00

Client ID: CAN 771 SHELF 56 Date Received: 02/19/15

Sample Location: Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Trichloroethene	ND	0.200	0.071	ND	1.07	0.382		1
2,2,4-Trimethylpentane	ND	0.200	0.066	ND	0.934	0.308		1
Methyl Methacrylate	ND	0.500	0.148	ND	2.05	0.606		1
Heptane	ND	0.200	0.055	ND	0.820	0.227		1
cis-1,3-Dichloropropene	ND	0.200	0.075	ND	0.908	0.338		1
4-Methyl-2-pentanone	ND	0.500	0.061	ND	2.05	0.249		1
trans-1,3-Dichloropropene	ND	0.200	0.069	ND	0.908	0.315		1
1,1,2-Trichloroethane	ND	0.200	0.067	ND	1.09	0.364		1
Toluene	ND	0.200	0.063	ND	0.754	0.237		1
1,3-Dichloropropane	ND	0.200	0.078	ND	0.924	0.359		1
2-Hexanone	ND	0.200	0.060	ND	0.820	0.248		1
Dibromochloromethane	ND	0.200	0.075	ND	1.70	0.636		1
1,2-Dibromoethane	ND	0.200	0.078	ND	1.54	0.599		1
Butyl acetate	ND	0.500	0.114	ND	2.38	0.542		1
Octane	ND	0.200	0.042	ND	0.934	0.197		1
Tetrachloroethene	ND	0.200	0.076	ND	1.36	0.514		1
1,1,1,2-Tetrachloroethane	ND	0.200	0.055	ND	1.37	0.376		1
Chlorobenzene	ND	0.200	0.079	ND	0.921	0.363		1
Ethylbenzene	ND	0.200	0.056	ND	0.869	0.241		1
p/m-Xylene	ND	0.400	0.139	ND	1.74	0.604		1
Bromoform	ND	0.200	0.052	ND	2.07	0.541		1
Styrene	ND	0.200	0.080	ND	0.852	0.340		1
1,1,2,2-Tetrachloroethane	ND	0.200	0.055	ND	1.37	0.376		1
o-Xylene	ND	0.200	0.063	ND	0.869	0.274		1
1,2,3-Trichloropropane	ND	0.200	0.077	ND	1.21	0.462		1
Nonane	ND	0.200	0.064	ND	1.05	0.338		1
Isopropylbenzene	ND	0.200	0.043	ND	0.983	0.211		1
Bromobenzene	ND	0.200	0.079	ND	0.793	0.313		1

Project Name: BATCH CANISTER CERTIFICATION **Lab Number:** L1503156

Project Number: CANISTER QC BAT **Report Date:** 03/25/15

Air Canister Certification Results

Lab ID: L1503156-01 Date Collected: 02/19/15 09:00

Client ID: CAN 771 SHELF 56 Date Received: 02/19/15

Sample Location: Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
2-Chlorotoluene	ND	0.200	0.049	ND	1.04	0.252		1
n-Propylbenzene	ND	0.200	0.056	ND	0.983	0.275		1
4-Chlorotoluene	ND	0.200	0.076	ND	1.04	0.396		1
4-Ethyltoluene	ND	0.200	0.078	ND	0.983	0.381		1
1,3,5-Trimethylbenzene	ND	0.200	0.058	ND	0.983	0.287		1
tert-Butylbenzene	ND	0.200	0.040	ND	1.10	0.221		1
1,2,4-Trimethylbenzene	ND	0.200	0.069	ND	0.983	0.341		1
Decane	ND	0.200	0.048	ND	1.16	0.282		1
Benzyl chloride	ND	0.200	0.065	ND	1.04	0.334		1
1,3-Dichlorobenzene	ND	0.200	0.064	ND	1.20	0.383		1
1,4-Dichlorobenzene	ND	0.200	0.042	ND	1.20	0.251		1
sec-Butylbenzene	ND	0.200	0.073	ND	1.10	0.401		1
p-Isopropyltoluene	ND	0.200	0.061	ND	1.10	0.334		1
1,2-Dichlorobenzene	ND	0.200	0.061	ND	1.20	0.369		1
n-Butylbenzene	ND	0.200	0.064	ND	1.10	0.351		1
1,2-Dibromo-3-chloropropane	ND	0.200	0.074	ND	1.93	0.719		1
Undecane	ND	0.200	0.053	ND	1.28	0.338		1
Dodecane	ND	0.200	0.056	ND	1.39	0.393		1
1,2,4-Trichlorobenzene	ND	0.200	0.061	ND	1.48	0.454		1
Naphthalene	ND	0.200	0.043	ND	1.05	0.227		1
1,2,3-Trichlorobenzene	ND	0.200	0.044	ND	1.48	0.324		1
Hexachlorobutadiene	ND	0.200	0.073	ND	2.13	0.781		1

	Results	**Qualifier**	**Units**	**RDL**	**Dilution Factor**
Tentatively Identified Compounds					
No Tentatively Identified Compounds					

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1503156
Report Date: 03/25/15

Air Canister Certification Results

Lab ID: L1503156-01
Client ID: CAN 771 SHELF 56
Sample Location:
Date Collected: 02/19/15 09:00
Date Received: 02/19/15
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	122		60-140
Bromochloromethane	117		60-140
chlorobenzene-d5	114		60-140

Project Name: BATCH CANISTER CERTIFICATION **Lab Number:** L1503156

Project Number: CANISTER QC BAT **Report Date:** 03/25/15

Air Canister Certification Results

Lab ID: L1503156-01
Client ID: CAN 771 SHELF 56
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 02/19/15 17:31
Analyst: RY

Date Collected: 02/19/15 09:00
Date Received: 02/19/15
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air by SIM - Mansfield Lab								
Dichlorodifluoromethane	ND	0.200	0.006	ND	0.989	0.030		1
Chloromethane	ND	0.200	0.048	ND	0.413	0.099		1
Freon-114	ND	0.050	0.005	ND	0.349	0.035		1
Vinyl chloride	ND	0.020	0.007	ND	0.051	0.018		1
1,3-Butadiene	ND	0.020	0.006	ND	0.044	0.013		1
Bromomethane	ND	0.020	0.008	ND	0.078	0.031		1
Chloroethane	ND	0.020	0.007	ND	0.053	0.019		1
Acetone	ND	1.00	0.133	ND	2.38	0.316		1
Trichlorofluoromethane	ND	0.050	0.008	ND	0.281	0.045		1
Acrylonitrile	ND	0.500	0.015	ND	1.09	0.033		1
1,1-Dichloroethene	ND	0.020	0.007	ND	0.079	0.028		1
Methylene chloride	ND	0.500	0.250	ND	1.74	0.869		1
Freon-113	ND	0.050	0.006	ND	0.383	0.046		1
Halothane	ND	0.050	0.008	ND	0.404	0.065		1
trans-1,2-Dichloroethene	ND	0.020	0.006	ND	0.079	0.024		1
1,1-Dichloroethane	ND	0.020	0.007	ND	0.081	0.028		1
Methyl tert butyl ether	ND	0.020	0.004	ND	0.072	0.014		1
2-Butanone	ND	0.500	0.025	ND	1.47	0.073		1
cis-1,2-Dichloroethene	ND	0.020	0.007	ND	0.079	0.026		1
Chloroform	ND	0.020	0.006	ND	0.098	0.029		1
1,2-Dichloroethane	ND	0.020	0.008	ND	0.081	0.032		1
1,1,1-Trichloroethane	ND	0.020	0.007	ND	0.109	0.038		1
Benzene	ND	0.100	0.021	ND	0.319	0.067		1
Carbon tetrachloride	ND	0.020	0.008	ND	0.126	0.050		1
1,2-Dichloropropane	ND	0.020	0.006	ND	0.092	0.028		1

Project Name: BATCH CANISTER CERTIFICATION **Lab Number:** L1503156

Project Number: CANISTER QC BAT **Report Date:** 03/25/15

Air Canister Certification Results

Lab ID: L1503156-01 Date Collected: 02/19/15 09:00

Client ID: CAN 771 SHELF 56 Date Received: 02/19/15

Sample Location: Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air by SIM - Mansfield Lab								
Bromodichloromethane	ND	0.020	0.008	ND	0.134	0.054		1
1,4-Dioxane	ND	0.100	0.050	ND	0.360	0.180		1
Trichloroethene	ND	0.020	0.007	ND	0.107	0.038		1
cis-1,3-Dichloropropene	ND	0.020	0.008	ND	0.091	0.036		1
4-Methyl-2-pentanone	ND	0.500	0.042	ND	2.05	0.172		1
trans-1,3-Dichloropropene	ND	0.020	0.008	ND	0.091	0.036		1
1,1,2-Trichloroethane	ND	0.020	0.009	ND	0.109	0.049		1
Toluene	ND	0.050	0.025	ND	0.188	0.094		1
Dibromochloromethane	ND	0.020	0.008	ND	0.170	0.068		1
1,2-Dibromoethane	ND	0.020	0.008	ND	0.154	0.062		1
Tetrachloroethene	ND	0.020	0.008	ND	0.136	0.054		1
1,1,1,2-Tetrachloroethane	ND	0.020	0.004	ND	0.137	0.028		1
Chlorobenzene	ND	0.020	0.008	ND	0.092	0.037		1
Ethylbenzene	ND	0.020	0.007	ND	0.087	0.030		1
p/m-Xylene	ND	0.040	0.009	ND	0.174	0.039		1
Bromoform	ND	0.020	0.015	ND	0.207	0.155		1
Styrene	ND	0.020	0.008	ND	0.085	0.034		1
1,1,2,2-Tetrachloroethane	ND	0.020	0.007	ND	0.137	0.048		1
o-Xylene	ND	0.020	0.008	ND	0.087	0.035		1
Isopropylbenzene	ND	0.200	0.046	ND	0.983	0.226		1
4-Ethyltoluene	ND	0.020	0.010	ND	0.098	0.048		1
1,3,5-Trimethybenzene	ND	0.020	0.005	ND	0.098	0.025		1
1,2,4-Trimethylbenzene	ND	0.020	0.007	ND	0.098	0.034		1
1,3-Dichlorobenzene	ND	0.020	0.007	ND	0.120	0.042		1
1,4-Dichlorobenzene	ND	0.020	0.008	ND	0.120	0.048		1
sec-Butylbenzene	ND	0.200	0.047	ND	1.10	0.258		1
p-Isopropyltoluene	ND	0.200	0.048	ND	1.10	0.263		1
1,2-Dichlorobenzene	ND	0.020	0.007	ND	0.120	0.042		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1503156
Report Date: 03/25/15

Air Canister Certification Results

Lab ID: L1503156-01
Client ID: CAN 771 SHELF 56
Sample Location:
Date Collected: 02/19/15 09:00
Date Received: 02/19/15
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air by SIM - Mansfield Lab								
n-Butylbenzene	ND	0.200	0.045	ND	1.10	0.247		1
1,2,4-Trichlorobenzene	ND	0.050	0.010	ND	0.371	0.074		1
Naphthalene	ND	0.050	0.012	ND	0.262	0.063		1
1,2,3-Trichlorobenzene	ND	0.050	0.019	ND	0.371	0.141		1
Hexachlorobutadiene	ND	0.050	0.011	ND	0.533	0.117		1

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-difluorobenzene	118		60-140
bromochloromethane	112		60-140
chlorobenzene-d5	111		60-140

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1503156
Report Date: 03/25/15

Air Canister Certification Results

Lab ID: L1503156-02
Client ID: CAN 1567 SHELF 57
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 02/19/15 18:08
Analyst: RY

Date Collected: 02/19/15 09:00
Date Received: 02/19/15
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air - Mansfield Lab								
Chlorodifluoromethane	ND	0.200	0.063	ND	0.707	0.221		1
Propylene	ND	0.500	0.093	ND	0.861	0.160		1
Propane	ND	0.500	0.114	ND	0.902	0.206		1
Dichlorodifluoromethane	ND	0.200	0.047	ND	0.989	0.230		1
Chloromethane	ND	0.200	0.096	ND	0.413	0.198		1
Freon-114	ND	0.200	0.042	ND	1.40	0.293		1
Methanol	ND	5.00	0.736	ND	6.55	0.964		1
Vinyl chloride	ND	0.200	0.053	ND	0.511	0.136		1
1,3-Butadiene	ND	0.200	0.080	ND	0.442	0.177		1
Butane	ND	0.200	0.044	ND	0.475	0.105		1
Bromomethane	ND	0.200	0.070	ND	0.777	0.270		1
Chloroethane	ND	0.200	0.077	ND	0.528	0.202		1
Ethanol	ND	2.50	0.542	ND	4.71	1.02		1
Dichlorofluoromethane	ND	0.200	0.057	ND	0.842	0.241		1
Vinyl bromide	ND	0.200	0.070	ND	0.874	0.306		1
Acrolein	ND	0.500	0.114	ND	1.15	0.261		1
Acetone	ND	1.00	0.269	ND	2.38	0.639		1
Acetonitrile	ND	0.200	0.076	ND	0.336	0.128		1
Trichlorofluoromethane	ND	0.200	0.042	ND	1.12	0.234		1
Isopropanol	ND	0.500	0.114	ND	1.23	0.280		1
Acrylonitrile	ND	0.500	0.079	ND	1.09	0.171		1
Pentane	ND	0.200	0.048	ND	0.590	0.140		1
Ethyl ether	ND	0.200	0.059	ND	0.606	0.179		1
1,1-Dichloroethene	ND	0.200	0.057	ND	0.793	0.224		1
Tertiary butyl Alcohol	ND	0.500	0.060	ND	1.52	0.182		1

Project Name: BATCH CANISTER CERTIFICATION **Lab Number:** L1503156

Project Number: CANISTER QC BAT **Report Date:** 03/25/15

Air Canister Certification Results

Lab ID: L1503156-02 Date Collected: 02/19/15 09:00

Client ID: CAN 1567 SHELF 57 Date Received: 02/19/15

Sample Location: Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Methylene chloride	ND	0.500	0.188	ND	1.74	0.653		1
3-Chloropropene	ND	0.200	0.081	ND	0.626	0.254		1
Carbon disulfide	ND	0.200	0.035	ND	0.623	0.107		1
Freon-113	ND	0.200	0.051	ND	1.53	0.392		1
trans-1,2-Dichloroethene	ND	0.200	0.074	ND	0.793	0.293		1
1,1-Dichloroethane	ND	0.200	0.077	ND	0.809	0.312		1
Methyl tert butyl ether	ND	0.200	0.045	ND	0.721	0.163		1
Vinyl acetate	ND	0.200	0.057	ND	0.704	0.200		1
2-Butanone	ND	0.500	0.052	ND	1.47	0.154		1
cis-1,2-Dichloroethene	ND	0.200	0.059	ND	0.793	0.233		1
Ethyl Acetate	ND	0.500	0.131	ND	1.80	0.472		1
Chloroform	ND	0.200	0.045	ND	0.977	0.221		1
Tetrahydrofuran	ND	0.500	0.062	ND	1.47	0.183		1
2,2-Dichloropropane	ND	0.200	0.058	ND	0.924	0.269		1
1,2-Dichloroethane	ND	0.200	0.055	ND	0.809	0.223		1
n-Hexane	ND	0.200	0.052	ND	0.705	0.183		1
Diisopropyl ether	ND	0.200	0.066	ND	0.836	0.274		1
tert-Butyl Ethyl Ether	ND	0.200	0.052	ND	0.836	0.215		1
1,1,1-Trichloroethane	ND	0.200	0.057	ND	1.09	0.311		1
1,1-Dichloropropene	ND	0.200	0.072	ND	0.908	0.325		1
Benzene	ND	0.200	0.054	ND	0.639	0.172		1
Carbon tetrachloride	ND	0.200	0.047	ND	1.26	0.296		1
Cyclohexane	ND	0.200	0.066	ND	0.688	0.226		1
tert-Amyl Methyl Ether	ND	0.200	0.080	ND	0.836	0.332		1
Dibromomethane	ND	0.200	0.048	ND	1.42	0.338		1
1,2-Dichloropropane	ND	0.200	0.070	ND	0.924	0.322		1
Bromodichloromethane	ND	0.200	0.066	ND	1.34	0.439		1
1,4-Dioxane	ND	0.200	0.078	ND	0.721	0.281		1

Project Name: BATCH CANISTER CERTIFICATION **Lab Number:** L1503156

Project Number: CANISTER QC BAT **Report Date:** 03/25/15

Air Canister Certification Results

Lab ID: L1503156-02 Date Collected: 02/19/15 09:00

Client ID: CAN 1567 SHELF 57 Date Received: 02/19/15

Sample Location: Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Trichloroethene	ND	0.200	0.071	ND	1.07	0.382		1
2,2,4-Trimethylpentane	ND	0.200	0.066	ND	0.934	0.308		1
Methyl Methacrylate	ND	0.500	0.148	ND	2.05	0.606		1
Heptane	ND	0.200	0.055	ND	0.820	0.227		1
cis-1,3-Dichloropropene	ND	0.200	0.075	ND	0.908	0.338		1
4-Methyl-2-pentanone	ND	0.500	0.061	ND	2.05	0.249		1
trans-1,3-Dichloropropene	ND	0.200	0.069	ND	0.908	0.315		1
1,1,2-Trichloroethane	ND	0.200	0.067	ND	1.09	0.364		1
Toluene	ND	0.200	0.063	ND	0.754	0.237		1
1,3-Dichloropropane	ND	0.200	0.078	ND	0.924	0.359		1
2-Hexanone	ND	0.200	0.060	ND	0.820	0.248		1
Dibromochloromethane	ND	0.200	0.075	ND	1.70	0.636		1
1,2-Dibromoethane	ND	0.200	0.078	ND	1.54	0.599		1
Butyl acetate	ND	0.500	0.114	ND	2.38	0.542		1
Octane	ND	0.200	0.042	ND	0.934	0.197		1
Tetrachloroethene	ND	0.200	0.076	ND	1.36	0.514		1
1,1,1,2-Tetrachloroethane	ND	0.200	0.055	ND	1.37	0.376		1
Chlorobenzene	ND	0.200	0.079	ND	0.921	0.363		1
Ethylbenzene	ND	0.200	0.056	ND	0.869	0.241		1
p/m-Xylene	ND	0.400	0.139	ND	1.74	0.604		1
Bromoform	ND	0.200	0.052	ND	2.07	0.541		1
Styrene	ND	0.200	0.080	ND	0.852	0.340		1
1,1,2,2-Tetrachloroethane	ND	0.200	0.055	ND	1.37	0.376		1
o-Xylene	ND	0.200	0.063	ND	0.869	0.274		1
1,2,3-Trichloropropane	ND	0.200	0.077	ND	1.21	0.462		1
Nonane	ND	0.200	0.064	ND	1.05	0.338		1
Isopropylbenzene	ND	0.200	0.043	ND	0.983	0.211		1
Bromobenzene	ND	0.200	0.079	ND	0.793	0.313		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1503156
Report Date: 03/25/15

Air Canister Certification Results

Lab ID: L1503156-02
Client ID: CAN 1567 SHELF 57
Sample Location:
Date Collected: 02/19/15 09:00
Date Received: 02/19/15
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air - Mansfield Lab								
2-Chlorotoluene	ND	0.200	0.049	ND	1.04	0.252		1
n-Propylbenzene	ND	0.200	0.056	ND	0.983	0.275		1
4-Chlorotoluene	ND	0.200	0.076	ND	1.04	0.396		1
4-Ethyltoluene	ND	0.200	0.078	ND	0.983	0.381		1
1,3,5-Trimethylbenzene	ND	0.200	0.058	ND	0.983	0.287		1
tert-Butylbenzene	ND	0.200	0.040	ND	1.10	0.221		1
1,2,4-Trimethylbenzene	ND	0.200	0.069	ND	0.983	0.341		1
Decane	ND	0.200	0.048	ND	1.16	0.282		1
Benzyl chloride	ND	0.200	0.065	ND	1.04	0.334		1
1,3-Dichlorobenzene	ND	0.200	0.064	ND	1.20	0.383		1
1,4-Dichlorobenzene	ND	0.200	0.042	ND	1.20	0.251		1
sec-Butylbenzene	ND	0.200	0.073	ND	1.10	0.401		1
p-Isopropyltoluene	ND	0.200	0.061	ND	1.10	0.334		1
1,2-Dichlorobenzene	ND	0.200	0.061	ND	1.20	0.369		1
n-Butylbenzene	ND	0.200	0.064	ND	1.10	0.351		1
1,2-Dibromo-3-chloropropane	ND	0.200	0.074	ND	1.93	0.719		1
Undecane	ND	0.200	0.053	ND	1.28	0.338		1
Dodecane	ND	0.200	0.056	ND	1.39	0.393		1
1,2,4-Trichlorobenzene	ND	0.200	0.061	ND	1.48	0.454		1
Naphthalene	ND	0.200	0.043	ND	1.05	0.227		1
1,2,3-Trichlorobenzene	ND	0.200	0.044	ND	1.48	0.324		1
Hexachlorobutadiene	ND	0.200	0.073	ND	2.13	0.781		1

	Results	Qualifier	Units	RDL	Dilution Factor
Tentatively Identified Compounds					
No Tentatively Identified Compounds					

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1503156
Report Date: 03/25/15

Air Canister Certification Results

Lab ID: L1503156-02
Client ID: CAN 1567 SHELF 57
Sample Location:
Date Collected: 02/19/15 09:00
Date Received: 02/19/15
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	111		60-140
Bromochloromethane	107		60-140
chlorobenzene-d5	101		60-140

Project Name: BATCH CANISTER CERTIFICATION **Lab Number:** L1503156

Project Number: CANISTER QC BAT **Report Date:** 03/25/15

Air Canister Certification Results

Lab ID: L1503156-02
Client ID: CAN 1567 SHELF 57
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 02/19/15 18:08
Analyst: RY

Date Collected: 02/19/15 09:00
Date Received: 02/19/15
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air by SIM - Mansfield Lab								
Dichlorodifluoromethane	ND	0.200	0.006	ND	0.989	0.030		1
Chloromethane	ND	0.200	0.048	ND	0.413	0.099		1
Freon-114	ND	0.050	0.005	ND	0.349	0.035		1
Vinyl chloride	ND	0.020	0.007	ND	0.051	0.018		1
1,3-Butadiene	ND	0.020	0.006	ND	0.044	0.013		1
Bromomethane	ND	0.020	0.008	ND	0.078	0.031		1
Chloroethane	ND	0.020	0.007	ND	0.053	0.019		1
Acetone	ND	1.00	0.133	ND	2.38	0.316		1
Trichlorofluoromethane	ND	0.050	0.008	ND	0.281	0.045		1
Acrylonitrile	ND	0.500	0.015	ND	1.09	0.033		1
1,1-Dichloroethene	ND	0.020	0.007	ND	0.079	0.028		1
Methylene chloride	ND	0.500	0.250	ND	1.74	0.869		1
Freon-113	ND	0.050	0.006	ND	0.383	0.046		1
Halothane	ND	0.050	0.008	ND	0.404	0.065		1
trans-1,2-Dichloroethene	ND	0.020	0.006	ND	0.079	0.024		1
1,1-Dichloroethane	ND	0.020	0.007	ND	0.081	0.028		1
Methyl tert butyl ether	ND	0.020	0.004	ND	0.072	0.014		1
2-Butanone	ND	0.500	0.025	ND	1.47	0.073		1
cis-1,2-Dichloroethene	ND	0.020	0.007	ND	0.079	0.026		1
Chloroform	ND	0.020	0.006	ND	0.098	0.029		1
1,2-Dichloroethane	ND	0.020	0.008	ND	0.081	0.032		1
1,1,1-Trichloroethane	ND	0.020	0.007	ND	0.109	0.038		1
Benzene	ND	0.100	0.021	ND	0.319	0.067		1
Carbon tetrachloride	ND	0.020	0.008	ND	0.126	0.050		1
1,2-Dichloropropane	ND	0.020	0.006	ND	0.092	0.028		1

Project Name: BATCH CANISTER CERTIFICATION **Lab Number:** L1503156

Project Number: CANISTER QC BAT **Report Date:** 03/25/15

Air Canister Certification Results

Lab ID: L1503156-02 Date Collected: 02/19/15 09:00

Client ID: CAN 1567 SHELF 57 Date Received: 02/19/15

Sample Location: Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air by SIM - Mansfield Lab								
Bromodichloromethane	ND	0.020	0.008	ND	0.134	0.054		1
1,4-Dioxane	ND	0.100	0.050	ND	0.360	0.180		1
Trichloroethene	ND	0.020	0.007	ND	0.107	0.038		1
cis-1,3-Dichloropropene	ND	0.020	0.008	ND	0.091	0.036		1
4-Methyl-2-pentanone	ND	0.500	0.042	ND	2.05	0.172		1
trans-1,3-Dichloropropene	ND	0.020	0.008	ND	0.091	0.036		1
1,1,2-Trichloroethane	ND	0.020	0.009	ND	0.109	0.049		1
Toluene	ND	0.050	0.025	ND	0.188	0.094		1
Dibromochloromethane	ND	0.020	0.008	ND	0.170	0.068		1
1,2-Dibromoethane	ND	0.020	0.008	ND	0.154	0.062		1
Tetrachloroethene	ND	0.020	0.008	ND	0.136	0.054		1
1,1,1,2-Tetrachloroethane	ND	0.020	0.004	ND	0.137	0.028		1
Chlorobenzene	ND	0.020	0.008	ND	0.092	0.037		1
Ethylbenzene	ND	0.020	0.007	ND	0.087	0.030		1
p/m-Xylene	ND	0.040	0.009	ND	0.174	0.039		1
Bromoform	ND	0.020	0.015	ND	0.207	0.155		1
Styrene	ND	0.020	0.008	ND	0.085	0.034		1
1,1,2,2-Tetrachloroethane	ND	0.020	0.007	ND	0.137	0.048		1
o-Xylene	ND	0.020	0.008	ND	0.087	0.035		1
Isopropylbenzene	ND	0.200	0.046	ND	0.983	0.226		1
4-Ethyltoluene	ND	0.020	0.010	ND	0.098	0.048		1
1,3,5-Trimethybenzene	ND	0.020	0.005	ND	0.098	0.025		1
1,2,4-Trimethylbenzene	ND	0.020	0.007	ND	0.098	0.034		1
1,3-Dichlorobenzene	ND	0.020	0.007	ND	0.120	0.042		1
1,4-Dichlorobenzene	ND	0.020	0.008	ND	0.120	0.048		1
sec-Butylbenzene	ND	0.200	0.047	ND	1.10	0.258		1
p-Isopropyltoluene	ND	0.200	0.048	ND	1.10	0.263		1
1,2-Dichlorobenzene	ND	0.020	0.007	ND	0.120	0.042		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1503156
Report Date: 03/25/15

Air Canister Certification Results

Lab ID: L1503156-02
Client ID: CAN 1567 SHELF 57
Sample Location:
Date Collected: 02/19/15 09:00
Date Received: 02/19/15
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air by SIM - Mansfield Lab								
n-Butylbenzene	ND	0.200	0.045	ND	1.10	0.247		1
1,2,4-Trichlorobenzene	ND	0.050	0.010	ND	0.371	0.074		1
Naphthalene	ND	0.050	0.012	ND	0.262	0.063		1
1,2,3-Trichlorobenzene	ND	0.050	0.019	ND	0.371	0.141		1
Hexachlorobutadiene	ND	0.050	0.011	ND	0.533	0.117		1

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-difluorobenzene	109		60-140
bromochloromethane	101		60-140
chlorobenzene-d5	100		60-140

AIR Petro Can Certification

Project Name: BATCH CANISTER CERTIFICATION **Lab Number:** L1502909

Project Number: CANISTER QC BAT **Report Date:** 03/25/15

AIR CAN CERTIFICATION RESULTS

Lab ID:	L1502909-01	Date Collected:	02/13/15 17:30
Client ID:	CAN 125 SHELF 15	Date Received:	02/14/15
Sample Location:	Not Specified	Field Prep:	Not Specified
Matrix:	Air		
Analytical Method:	96,APH		
Analytical Date:	02/14/15 15:31		
Analyst:	RY		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbons in Air - Mansfield Lab						
1,3-Butadiene	ND		ug/m3	2.0	2.0	1
Methyl tert butyl ether	ND		ug/m3	2.0	2.0	1
Benzene	ND		ug/m3	2.0	2.0	1
C5-C8 Aliphatics, Adjusted	ND		ug/m3	12	12.	1
Toluene	ND		ug/m3	2.0	2.0	1
Ethylbenzene	ND		ug/m3	2.0	2.0	1
p/m-Xylene	ND		ug/m3	4.0	4.0	1
o-Xylene	ND		ug/m3	2.0	2.0	1
Naphthalene	ND		ug/m3	2.0	2.0	1
C9-C12 Aliphatics, Adjusted	ND		ug/m3	14	14.	1
C9-C10 Aromatics Total	ND		ug/m3	10	10.	1

Project Name: BATCH CANISTER CERTIFICATION **Lab Number:** L1503156

Project Number: CANISTER QC BAT **Report Date:** 03/25/15

AIR CAN CERTIFICATION RESULTS

Lab ID:	L1503156-01	Date Collected:	02/19/15 09:00
Client ID:	CAN 771 SHELF 56	Date Received:	02/19/15
Sample Location:	Not Specified	Field Prep:	Not Specified
Matrix:	Air		
Analytical Method:	96,APH		
Analytical Date:	02/19/15 17:31		
Analyst:	RY		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbons in Air - Mansfield Lab						
1,3-Butadiene	ND		ug/m3	2.0	2.0	1
Methyl tert butyl ether	ND		ug/m3	2.0	2.0	1
Benzene	ND		ug/m3	2.0	2.0	1
C5-C8 Aliphatics, Adjusted	ND		ug/m3	12	12.	1
Toluene	ND		ug/m3	2.0	2.0	1
Ethylbenzene	ND		ug/m3	2.0	2.0	1
p/m-Xylene	ND		ug/m3	4.0	4.0	1
o-Xylene	ND		ug/m3	2.0	2.0	1
Naphthalene	ND		ug/m3	2.0	2.0	1
C9-C12 Aliphatics, Adjusted	ND		ug/m3	14	14.	1
C9-C10 Aromatics Total	ND		ug/m3	10	10.	1

Project Name: BATCH CANISTER CERTIFICATION **Lab Number:** L1503156

Project Number: CANISTER QC BAT **Report Date:** 03/25/15

AIR CAN CERTIFICATION RESULTS

Lab ID:	L1503156-02	Date Collected:	02/19/15 09:00
Client ID:	CAN 1567 SHELF 57	Date Received:	02/19/15
Sample Location:	Not Specified	Field Prep:	Not Specified
Matrix:	Air		
Analytical Method:	96,APH		
Analytical Date:	02/19/15 18:08		
Analyst:	RY		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbons in Air - Mansfield Lab						
1,3-Butadiene	ND		ug/m3	2.0	2.0	1
Methyl tert butyl ether	ND		ug/m3	2.0	2.0	1
Benzene	ND		ug/m3	2.0	2.0	1
C5-C8 Aliphatics, Adjusted	ND		ug/m3	12	12.	1
Toluene	ND		ug/m3	2.0	2.0	1
Ethylbenzene	ND		ug/m3	2.0	2.0	1
p/m-Xylene	ND		ug/m3	4.0	4.0	1
o-Xylene	ND		ug/m3	2.0	2.0	1
Naphthalene	ND		ug/m3	2.0	2.0	1
C9-C12 Aliphatics, Adjusted	ND		ug/m3	14	14.	1
C9-C10 Aromatics Total	ND		ug/m3	10	10.	1

Project Name: CUMMINGS BEVERLY
Project Number: CUMMINGS BEVERLY

Lab Number: L1504425
Report Date: 03/25/15

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Reagent H2O Preserved Vials Frozen on: NA

Cooler Information **Custody Seal**
Cooler
N/A Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1504425-01A	Canister - 6 Liter	N/A	NA		Y	Absent	APH-10(30),TO15-LL(30),TO15-SIM(30)
L1504425-02A	Canister - 6 Liter	N/A	NA		Y	Absent	APH-10(30),TO15-LL(30),TO15-SIM(30)
L1504425-03A	Canister - 6 Liter	N/A	NA		Y	Absent	APH-10(30),TO15-LL(30),TO15-SIM(30)
L1504425-04A	Canister - 6 Liter	N/A	NA		Y	Absent	APH-10(30),TO15-LL(30),TO15-SIM(30)
L1504425-05A	Canister - 6 Liter	N/A	NA		Y	Absent	APH-10(30),TO15-LL(30),TO15-SIM(30)
L1504425-06A	Canister - 6 Liter	N/A	NA		Y	Absent	APH-10(30),TO15-LL(30),TO15-SIM(30)
L1504425-07A	Canister - 2.7 Liter	N/A	NA		Y	Absent	APH-10(30),TO15-LL(30),TO15-SIM(30)
L1504425-08A	Canister - 2.7 Liter	N/A	NA		Y	Absent	APH-10(30),TO15-LL(30),TO15-SIM(30)
L1504425-09A	Canister - 2.7 Liter	N/A	NA		Y	Absent	APH-10(30),TO15-LL(30),TO15-SIM(30)
L1504425-10A	Canister - 2.7 Liter	N/A	NA		Y	Absent	APH-10(30),TO15-LL(30),TO15-SIM(30)
L1504425-11A	Canister - 2.7 Liter	N/A	NA		Y	Absent	APH-10(30),TO15-LL(30),TO15-SIM(30)

*Values in parentheses indicate holding time in days

Project Name:	CUMMINGS BEVERLY	**Lab Number:**	L1504425
Project Number:	CUMMINGS BEVERLY	**Report Date:**	03/25/15

GLOSSARY

Acronyms

EDL - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NI - Not Ignitable.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Data Qualifiers

A - Spectra identified as "Aldol Condensation Product".

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

Report Format: DU Report with 'J' Qualifiers

Project Name:	CUMMINGS BEVERLY	**Lab Number:**	L1504425
Project Number:	CUMMINGS BEVERLY	**Report Date:**	03/25/15

Data Qualifiers

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

J - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

ND - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

Report Format: DU Report with 'J' Qualifiers

Project Name:	CUMMINGS BEVERLY	**Lab Number:**	L1504425
Project Number:	CUMMINGS BEVERLY	**Report Date:**	03/25/15

REFERENCES

48 Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air. Second Edition. EPA/625/R-96/010b, January 1999.

96 Method for the Determination of Air-Phase Petroleum Hydrocarbons (APH), MassDEP, December 2009, Revision 1 with QC Requirements & Performance Standards for the Analysis of APH by GC/MS under the Massachusetts Contingency Plan, WSC-CAM-IXA, July 2010.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

Last revised December 16, 2014

The following analytes are not included in our NELAP Scope of Accreditation:

Westborough Facility
EPA 524.2: Acetone, 2-Butanone (Methyl ethyl ketone (MEK)), Tert-butyl alcohol, 2-Hexanone, Tetrahydrofuran, 1,3,5-Trichlorobenzene, 4-Methyl-2-pentanone (MIBK), Carbon disulfide, Diethyl ether.
EPA 8260C: 1,2,4,5-Tetramethylbenzene, 4-Ethyltoluene, Iodomethane (methyl iodide), Methyl methacrylate, Azobenzene.
EPA 8270D: 1-Methylnaphthalene, Dimethylnaphthalene,1,4-Diphenylhydrazine.
EPA 625: 4-Chloroaniline, 4-Methylphenol.
SM4500: Soil: Total Phosphorus, TKN, NO2, NO3.
EPA 9071: Total Petroleum Hydrocarbons, Oil & Grease.

Mansfield Facility
EPA 8270D: Biphenyl.
EPA 2540D: TSS
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

The following analytes are included in our Massachusetts DEP Scope of Accreditation, Westborough Facility:

Drinking Water
EPA 200.8: Sb,As,Ba,Be,Cd,Cr,Cu,Pb,Ni,Se,Tl; **EPA 200.7**: Ba,Be,Ca,Cd,Cr,Cu,Na; **EPA 245.1:** Mercury;
EPA 300.0: Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B**
EPA 332: Perchlorate.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, Enterolert-QT.**

Non-Potable Water
EPA 200.8: Al,Sb,As,Be,Cd,Cr,Cu,Pb,Mn,Ni,Se,Ag,Tl,Zn;
EPA 200.7: Al,Sb,As,Be,Cd,Ca,Cr,Co,Cu,Fe,Pb,Mg,Mn,Mo,Ni,K,Se,Ag,Na,Sr,Ti,Tl,V,Zn;
EPA 245.1, SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2340B, SM2320B, SM4500CL-E, SM4500F-BC, SM426C, SM4500NH3-BH, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500NH3-BC-NES, EPA 351.1, SM4500P-E, SM4500P-B, E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, SM14 510AC, EPA 420.1, SM4500-CN-CE, SM2540D.**
EPA 624: Volatile Halocarbons & Aromatics,
EPA 608: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9222D-MF**.

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

Serial_No:03251515:00

AIR ANALYSIS

PAGE 1 OF 2

CHAIN OF CUSTODY

ALPHA ANALYTICAL
320 Forbes Blvd, Mansfield, MA 02048
TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab: 3/10/15

ALPHA Job #: L1504425

Client Information

Client: FSL Associates, Inc.
Address: 358 Chestnut Hill Ave
Boston, MA 02135
Phone: (617) 232-0001
Fax: (617) 232-7800
Email: bhoskins@fslassociates.com

☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: Cummings Beverly
Project Location: 181 Elliott Street
Project #:
Project Manager: Bruce Hoskins
ALPHA Quote #:

Turn-Around Time

☑ Standard ☐ RUSH (only confirmed if pre-approved!)
Date Due: 3/17/15 Time:

Report Information - Data Deliverables

☐ FAX
☐ ADEx
Criteria Checker:
(Default based on Regulatory Criteria Indicated)
Other Formats:
☑ EMAIL (standard pdf report)
☑ Additional Deliverables: 1 hard copy in mail
Report to: (if different than Project Manager)

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements/Report Limits

State/Fed	Program	Criteria

Other Project Specific Requirements/Comments:
SIM analysis for TO-15; where SIM not possible for analytes, use regular TO-15.
Possibility of Presence of VOCs and Petroleum Hydrocarbons

All Columns Below Must Be Filled Out

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Start Time	End Time	Initial Vacuum	Final Vacuum	Sample Matrix*	Sampler's Initials	Can Size	I D Can	I D - Flow Controller	ANALYSIS: TO-14A by TO-15	TO-15	TO-15 SIM	APH	FIXED GASES	TO-13A	TO-4 / TO-10	Sample Comments (i.e. PID)
04425.01	Outdoor Control	3/6-3/8/14	18:40 3/6	13:31 3/8	-30.32	-0.52	AA	JC	6L	1889	0102		X	X	X				
02	S-157-2.1	3/6-3/8/14	18:34 3/6	13:29 3/8	-30.35	0.00	AA	JC	6L	1662	0114		X	X	X				
03	S-157-2.2	3/6-3/8/14	18:26 3/6	13:22 3/8	-30.70	0.00	AA	JC	6L	985	0285		X	X	X				
04	S-157-2	3/6-3/8/14	18:34 3/6	13:24 3/8	-26.05	0.00	AA	JC	6L	1598	0354		X	X	X				
05	Duplicate	3/6-3/8/14	18:33 3/6	13:24 3/8	-30.37	0.00	AA	JC	6L	1794	0243		X	X	X				
06	Blank	3/6/14	N/A	N/A	N/A	N/A	AA	JC	6L	1050	0551		X	X	X				
07	SG-1	3/6/14	19:12	19:43	-29.94	0.00	SV	JC	2.7L	259	0309		X	X	X				
08	SG-2	3/6/14	18:21	18:51	-30.01	-0.44	SV	JC	2.7L	1748	0342		X	X	X				
09	SG-3	3/6/14	19:01	19:31	-28.96	0.00	SV	JC	2.7L	383	0389		X	X	X				
10	SG-4	3/6/14	19:32	20:02	-30.25	-1.40	SV	JC	2.7L	2015	0259		X	X	X				

*SAMPLE MATRIX CODES
AA = Ambient Air (Indoor/Outdoor)
SV = Soil Vapor/Landfill Gas/SVE
Other = Please Specify

Container Type

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

Relinquished By:	Date/Time	Received By:	Date/Time:
	3/10/15 11:05		3/10/15 11:05
	3/10/15 12:30		3/10/15 12:30
	3/11/15 0300		3/11/15 0300

Serial_No:03251515:00

AIR ANALYSIS

PAGE 2 OF 2

CHAIN OF CUSTODY

320 Forbes Blvd, Mansfield, MA 02048
TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab: 3/10/15

ALPHA Job #: L1504475

Client Information

Client: FSL Associates, Inc
Address: 358 Chestnut Hill Ave
Boston, MA 02135
Phone: 617-232-0001
Fax: 617-232-7800
Email: bhoskins@fslassociates.com

☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: Cummings Beverly
Project Location: 181 Eliott Street, Beverly
Project #:
Project Manager: Bruce Hoskins
ALPHA Quote #:

Turn-Around Time

☑ Standard ☐ RUSH (only confirmed if pre-approved!)

Date Due: 3/17/15 Time:

Report Information - Data Deliverables

☐ FAX
☐ ADEx
Criteria Checker:
(Default based on Regulatory Criteria Indicated)
Other Formats:
☑ EMAIL (standard pdf report)
☑ Additional Deliverables: Hard copy in mail
Report to: (if different than Project Manager)

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements/Report Limits

State/Fed	Program	Criteria

Other Project Specific Requirements/Comments:

All Columns Below Must Be Filled Out

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Start Time	End Time	Initial Vacuum	Final Vacuum	Sample Matrix*	Sampler's Initials	Can Size	I D Can	I D - Flow Controller	ANALYSIS TO-14A by TO-15	TO-15	TO-15 SIM	APH	FIXED GASES	TO-13A	TO-4 / TO-10	Sample Comments (i.e. PID)
04425.11	SG Blank	3/6/14	N/A	N/A	N/A	N/A	SV	JC	2.7L	1744	0162		X	X	X				

*SAMPLE MATRIX CODES
AA = Ambient Air (Indoor/Outdoor)
SV = Soil Vapor/Landfill Gas/SVE
Other = Please Specify

Container Type

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

Relinquished By:	Date/Time	Received By:	Date/Time:
	3/10/15 11:05		3-10-15 1105
	3-10-15		3/10/15 12:50
	3/11/15 0830		3/11/15 0800

R.I. ANALYTICAL
Specialists in Environmental Services

CERTIFICATE OF ANALYSIS

FSL Associates, Inc.
Attn: Jarod Cournoyer
358 Chestnut Hill Avenue
Brighton, MA 02135

Date Received: 2/25/15
Date Reported: 3/4/15
P.O. #:
Work Order #: 1502-03854

DESCRIPTION: 181 ELIOTT STREET, BUILDING 100

Subject sample(s) has/have been analyzed by our Warwick, R.I. laboratory with the attached results.

Reference: All parameters were analyzed by U.S. EPA and Massachusetts Contingency Plan (MCP) approved methodologies where applicable. The specific methodologies are listed in the methods column of the Certificate of Analysis.

Data qualifiers (if present) are explained in full at the end of a given sample's analytical results.

Certification #: RI LAI00033, MA M-RI015, CT PH-0508, ME RI00015
NH 2537, NY 11726

This Certificate represents all data associated with the referenced work order and is paginated for completeness. The complete Certificate includes one attachment; the original Chain of Custody.

If you have any questions regarding this work, or if we may be of further assistance, please contact our customer service department.

Approved by:

Data Reporting

enc: Chain of Custody

MassDEP Analytical Protocol Certification Form

Laboratory Name: R.I. Analytical Laboratories Work Order #: 1502-03854

Project / Location: 181 ELIOTT STREET, BUILDING 100 RTN :

This Form provides certifications for the following data set: list Laboratory Sample ID Number(s):

1502-03854-001 through 1502-03854-001

Matrices: ☐ Groundwater/Surface Water ☒ Soil / Sediment ☐ Drinking Water ☐ Air ☐ Other

CAM Protocol (check all that apply below):

8260 VOC CAM II A ☐	7470/7471 Hg CAM III B ☐	MassDEP VPH CAM IV A ☐	8081 Pesticides CAM V B ☐	7196 Hex Cr CAM VI B ☐	MassDEP APH CAM IX A ☐
8270 SVOC CAM II B ☐	7010 Metals CAM III C ☐	MassDEP EPH CAM IV B ☒	8151 Herbicides CAM V C ☐	8330 Explosives CAM VIII A ☐	TO-15 VOC CAM IX B ☐
6010 Metals CAM III A ☐	6020 Metals CAM III D ☐	8082 PCB CAM V A ☐	9014 Total Cyanide /PAC CAM VI A ☐	6860 Perchlorate CAM V111 B ☐	

Affirmative responses to Questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	☒ Yes ☐ No
B	Were the analytical methods(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	☒ Yes ☐ No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	☒ Yes ☐ No
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Aquisition and Reporting of Analytical Data"?	☒ Yes ☐ No
E	a. VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s) ? (Refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	☒ Yes ☐ No ☐ Yes ☐ No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	☒ Yes ☐ No

Responses to Questions G,H and I below are required for "Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	☒ Yes ☐ No [1]

***Data User Note:** Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.*

H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	☒ Yes ☐ No [1]
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	☒ Yes ☐ No [1]

[1] *All negative responses must be addressed in an attached laboratory narrative.*

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, is accurate and complete.

Signature _____ Position: Laboratory Director

Printed Name: Eric H. Jensen Date: 3-4-15

Case Narrative

Date: 3/4/2015

FSL Associates, Inc.
Attn: Jarod Cournoyer

358 Chestnut Hill Avenue
Brighton, MA 02135

Project: 181 ELIOTT STREET, BUILDING 100

Work Order #: 1502-03854

All QA/QC procedures required by the EPH Method were followed. All performance/acceptance standards for the required QA/QC procedures were achieved or otherwise stated in this case narrative. A fractionation check was performed on the silica gel lot associated with this sample and found to pass the method criteria unless otherwise stated here. The data reported for this sample was not corrected for instrument/solvent baseline effects. No significant modifications were made to the EPH Method.

There were no exceptions or analytical issues to discuss concerning the testing requirements for the project.

R.I. Analytical Laboratories, Inc.
CERTIFICATE OF ANALYSIS

FSL Associates, Inc.

Date Received: 2/25/15
Work Order #: 1502-03854
181 ELIOTT STREET, BUILDING 100

Sample # 001
SAMPLE DESCRIPTION: SG-1 SOIL
SAMPLE TYPE: GRAB **SAMPLE DATE/TIME:** 2/25/2015 @ 09:58

PARAMETER	SAMPLE RESULTS	DET. LIMIT	UNITS	METHOD	DATE ANALYZED		ANALYST
EPH/PAH							
C9-C18 Aliphatics	92	50	mg/kg dry	MADEP	2/27/15	13:11	KD
C19-C36 Aliphatics	110	50	mg/kg dry	MADEP	2/27/15	13:11	KD
Unadj. C11-C22 Aromatics	<50	50	mg/kg dry	MADEP	2/27/15	13:11	KD
Adj. C11-C22 Aromatics	<50	50	mg/kg dry	MADEP	2/27/15	13:11	KD
Target PAH Analytes							
Naphthalene	<0.7	0.7	mg/kg dry	MADEP	2/27/15	13:11	KD
2-Methylnaphthalene	<0.7	0.7	mg/kg dry	MADEP	2/27/15	13:11	KD
Acenaphthylene	<0.7	0.7	mg/kg dry	MADEP	2/27/15	13:11	KD
Acenaphthene	<0.7	0.7	mg/kg dry	MADEP	2/27/15	13:11	KD
Fluorene	<0.7	0.7	mg/kg dry	MADEP	2/27/15	13:11	KD
Phenanthrene	<0.7	0.7	mg/kg dry	MADEP	2/27/15	13:11	KD
Anthracene	<0.7	0.7	mg/kg dry	MADEP	2/27/15	13:11	KD
Fluoranthene	<0.7	0.7	mg/kg dry	MADEP	2/27/15	13:11	KD
Pyrene	<0.7	0.7	mg/kg dry	MADEP	2/27/15	13:11	KD
Benzo(a)anthracene	<0.7	0.7	mg/kg dry	MADEP	2/27/15	13:11	KD
Chrysene	<0.7	0.7	mg/kg dry	MADEP	2/27/15	13:11	KD
Benzo(b)fluoranthene	<0.7	0.7	mg/kg dry	MADEP	2/27/15	13:11	KD
Benzo(k)fluoranthene	<0.7	0.7	mg/kg dry	MADEP	2/27/15	13:11	KD
Benzo(a)pyrene	<0.7	0.7	mg/kg dry	MADEP	2/27/15	13:11	KD
Indeno(1,2,3-cd)pyrene	<0.7	0.7	mg/kg dry	MADEP	2/27/15	13:11	KD
Dibenzo(a,h)anthracene	<0.7	0.7	mg/kg dry	MADEP	2/27/15	13:11	KD
Benzo(g,h,i)perylene	<0.7	0.7	mg/kg dry	MADEP	2/27/15	13:11	KD
Moisture	10.2		%	SM2540 G. 18-21 ed.	2/25/15	20:55	AK
Extraction Surrogates			RANGE				
5-alpha-Androstane	73		40-140%	MADEP	2/27/15	13:11	KD
Ortho-terphenyl	77		40-140%	MADEP	2/27/15	13:11	KD
Fractionation Surrogates			RANGE				
2-Fluorobiphenyl	93		40-140%	MADEP	2/27/15	13:11	KD
2-Bromonaphthalene	83		40-140%	MADEP	2/27/15	13:11	KD
Extraction date				MADEP	2/26/15	15:10	KS

QA/QC Report

Client: FSL Associates, Inc.
WO #: 1502-03854
Date: 3/4/2015

-Method Blanks Results-

Parameter	Units	Results	Date Analyzed
Extractable Petroleum Hydrocarbons with PAH			
C9-C18 Aliphatics	mg/kg dry	<20	2/27/2015
C19-C36 Aliphatics	mg/kg dry	<20	2/27/2015
Unadj. C11-C22 Aromatics	mg/kg dry	<20	2/27/2015
Adj. C11-C22 Aromatics	mg/kg dry	<20	2/27/2015
Target PAH Analytes			2/27/2015
Naphthalene	mg/kg dry	<0.4	2/27/2015
2-Methylnaphthalene	mg/kg dry	<0.4	2/27/2015
Acenaphthylene	mg/kg dry	<0.4	2/27/2015
Acenaphthene	mg/kg dry	<0.4	2/27/2015
Fluorene	mg/kg dry	<0.4	2/27/2015
Phenanthrene	mg/kg dry	<0.4	2/27/2015
Anthracene	mg/kg dry	<0.4	2/27/2015
Fluoranthene	mg/kg dry	<0.4	2/27/2015
Pyrene	mg/kg dry	<0.4	2/27/2015
Benzo(a)anthracene	mg/kg dry	<0.4	2/27/2015
Chrysene	mg/kg dry	<0.4	2/27/2015
Benzo(b)fluoranthene	mg/kg dry	<0.4	2/27/2015
Benzo(k)fluoranthene	mg/kg dry	<0.4	2/27/2015
Benzo(a)pyrene	mg/kg dry	<0.4	2/27/2015
Indeno(1,2,3-cd)pyrene	mg/kg dry	<0.4	2/27/2015
Dibenzo(a,h)anthracene	mg/kg dry	<0.4	2/27/2015
Benzo(g,h,i)perylene	mg/kg dry	<0.4	2/27/2015
Extraction Surrogates	**RANGE**		2/27/2015
5-alpha-Androstane	40-140%	74	2/27/2015
Ortho-terphenyl	40-140%	88	2/27/2015
Fractionation Surrogates	**RANGE**		2/27/2015
2-Fluorobiphenyl	40-140%	107	2/27/2015
2-Bromonaphthalene	40-140%	97	2/27/2015

-LCS/LCS Duplicate Data Results-

Parameter	CRM Acceptance Limits	Spike Conc	LCS Conc	LCS % Rec	LCS Dup Conc	LCS DUP % Rec	% RPD	Date Analyzed
Extractable Petroleum Hydrocarbons with PAH - Solids								
Target PAH Analytes								
Naphthalene		3.33	1.68	50	2.00	60	17	2/27/2015
2-Methylnaphthalene		3.33	1.78	53	2.05	62	14	2/27/2015
Acenaphthylene		3.33	1.82	55	2.11	63	15	2/27/2015
Acenaphthene		3.33	1.81	54	2.12	64	16	2/27/2015
Fluorene		3.33	1.93	58	2.27	68	16	2/27/2015
Phenanthrene		3.33	2.08	62	2.46	74	17	2/27/2015
Anthracene		3.33	1.99	60	2.34	70	16	2/27/2015
Fluoranthene		3.33	2.23	67	2.63	79	16	2/27/2015
Pyrene		3.33	2.22	67	2.57	77	15	2/27/2015
Benzo(a)anthracene		3.33	2.32	70	2.79	84	18	2/27/2015
Chrysene		3.33	2.25	68	2.64	79	16	2/27/2015
Benzo(b)fluoranthene		3.33	2.45	74	2.90	87	17	2/27/2015
Benzo(k)fluoranthene		3.33	2.36	71	2.63	79	11	2/27/2015
Benzo(a)pyrene		3.33	2.27	68	2.66	80	16	2/27/2015
Indeno(1,2,3-cd)pyrene		3.33	2.38	71	2.82	85	17	2/27/2015
Dibenzo(a,h)anthracene		3.33	2.44	73	2.88	86	17	2/27/2015
Benzo(g,h,i)perylene		3.33	2.39	72	2.81	84	16	2/27/2015
Aliphatic Analytes								
n-Nonane		3.33	1.14	34	1.09	33	4	2/27/2015
n-Decane		3.33	1.59	48	1.52	46	5	2/27/2015
n-Dodecane		3.33	1.89	57	1.81	54	4	2/27/2015
n-Tetradecane		3.33	2.12	64	2.05	62	3	2/27/2015
n-Hexadecane		3.33	2.39	72	2.35	71	2	2/27/2015
n-Octadecane		3.33	2.32	70	2.34	70	1	2/27/2015
n-Nonadecane		3.33	2.26	68	2.28	68	1	2/27/2015
n-Eicosane		3.33	2.48	74	2.48	74	0	2/27/2015
n-Docasane		3.33	2.33	70	2.36	71	1	2/27/2015
n-Tetracosane		3.33	2.28	68	2.32	70	2	2/27/2015
n-Hexacosane		3.33	2.25	68	2.30	69	2	2/27/2015
n-Octacosane		3.33	2.21	66	2.27	68	3	2/27/2015
n-Triacontane		3.33	2.20	66	2.25	68	2	2/27/2015
n-Hexatriacontane		3.33	2.31	69	2.36	71	2	2/27/2015
Extraction Surrogates								
5-alpha-Androstane			78		70			2/27/2015
Ortho-terphenyl			73		77			2/27/2015
Fractionation Surrogates								
2-Fluorobiphenyl			92		96			2/27/2015
2-Bromonaphthalene			79		81			2/27/2015
Breakthrough Analytes								
Naphthalene-			0		0			2/27/2015
2-Methylnaphthalene-			1		1			2/27/2015

R.I. ANALYTICAL
Specialists in Environmental Services

CHAIN OF CUSTODY RECORD

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02-25-15

Date Collected	Time Collected	Field Sample Identification	Grab or Composite	# of Containers & Type [C]	Preservation Code [P]	Matrix Code [M]	EPH/PAH
02/25/15	9:58 am	SG-1 Soil	G	1G	NP	S	X

Client Information

Company Name: FSL Associates
Address: 358 Chestnut Hill Avenue
City / State / Zip: Boston, MA 02135
Telephone: 617-232-0001 Fax: 617-232-7800
Contact Person: Bruce Hoskins

Project Information

Project Name: 181 Eliott Street, Building 100
P.O. Number: Project Number:
Report To: JC and BH Phone: 617-232-0001 Fax 617-232-7800
Sampled by: JC
Quote No:
Email report to these addresses: jarod@fslassociates.com; bhoskins@fslassociates.com

Relinquished By Signatures	Date	Time	Received By Signatures	Date	Time
	02/25/15	12:23pm		2/25/15	1:40pm
	2/25/15	2:58pm		2/25/15	1452

Turn Around Time

- [X] Normal [X] EMAIL Report
- [ ] 5 Business days.
- [ ] Rush – Date Due: ___/___/___

Project Comments

Circle if applicable: GW-1, GW-2, GW-3, (S-1) S-2, S-3 MCP Data Enhancement QC Package? (Yes) No

Temp. Upon Receipt 1.2°C

Lab Use Only

- [ ] Sample Pick Up Only
- [ ] RIAL sampled; attach field hours
- [✓] Shipped on ice

Workorder No: 1502-03854

Containers: P=Poly, G=Glass, AG=Amber Glass, V=Vial, St=Sterile Preservatives: A=Ascorbic Acid, NH4=NH_4Cl, H=HCl, M=MeOH, N=HNO_3, NP=None, S=H_2SO_4, SB=$NaHSO_4$, SH=NaOH, T=$Na_2S_2O_3$, Z=ZnOAc
Matrix Codes: GW=Groundwater, SW=Surface Water, WW=Wastewater, DW=Drinking Water, S=Soil, SL=Sludge, A=Air, B=Bulk/Solid, WP=Wipe, O=_____

Appendix E

Data Validation Review Memorandum

Memorandum

To: **Bruce Hoskins**

From: **Jarod Cournoyer**

Date: **March 27, 2015**

RE: **Data Validation Review: Air Samples: Cummings Center, Beverly, MA: Laboratory Report #L1504425**

SUMMARY

Limited validation was performed on the data for six indoor air samples and five soil gas samples collected at the Cummings Center in Beverly, MA. The indoor air samples were collected for a minimum 24-hour period and began on March 6, 2015, and concluded on March 7, 2015. Soil gas samples were collected for a 60-minute period on March 6, 2015. The samples were submitted to Alpha Analytical of Mansfield, MA for analysis. The samples were analyzed for volatile petroleum hydrocarbons (VOCs) using the EPA Methodology for TO-15 and TO-15 Selected Ion Monitoring (SIM) and air-phase petroleum hydrocarbons (APH) per Massachusetts Department of Environmental Protection (MassDEP) methodology per the Compendium of Analytical Methods (CAM).

In general, the data appear to be valid as reported and may be used for decision-making purposes. For TO-15 analysis, two compounds were detected in the method blank at estimated concentrations below the method detection limits; Naphthalene was detected at 0.015 ug/m^3 (detection limit of 0.063 ug/m^3) and 1,2,4-Trichlorobenzene was detected at 0.0011 ug/m^3 (detection limit of 0.074 ug/m^3). For the TO-15 analysis, four compounds (acetone, ethanol, 2-butanone, and m/p-xylene) were detected in the soil gas field blank at estimated concentrations below the method detection limits; also, 1,2,4-trimethylbenzene was detected at a concentration of 0.172 ug/m^3. The results for acetone in sample SG-4 should be considered estimated due to co-elution with a non-target peak. The results for isopropyl alcohol for samples SG-1 through SG-3 could not be determined due to a non-target compound interfering with the identification and quantification of that compound. These issues have a minor impact on the data usability.

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SAMPLES

Samples included in this review are listed below:

Indoor Air

Outdoor Control (Alpha ID Number L1504425-01)
S-157-J (Alpha ID Number L1504425-04)
Duplicate of S-157-J (Alpha ID Number L1504425-05)
S-157-J.1 (Alpha ID Number L1504425-02)
S-157-J.2 (Alpha ID Number L1504425-03)
Blank (Alpha ID Number L1504425-06)

Soil Gas

SG-1 (Alpha ID Number L1504425-07)
SG-2 (Alpha ID Number L1504425-08)
SG-3 (Alpha ID Number L1504425-09)
SG-4 (Alpha ID Number L1504425-10)
SG Blank (Alpha ID Number L1504425-11)

REVIEW ELEMENTS

Sample data were reviewed for the following parameters:

- Agreement of analyses conducted with FSL requests
- Holding times and sample preservation
- Method blanks
- Laboratory control sample (LCS) results
- Field duplicate results
- Field blank Results
- Quantitation limits and sample results
- Air canister certification results

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DISCUSSION

Agreement of Analyses Conducted with FSL Requests

The sample report was checked to verify that the results corresponded to analytical requests as designated on the chain-of-custody and any other correspondence between FSL and the laboratory. An initial laboratory analysis report was submitted on March 18, 2015, however there was a discrepancy as. 1,1,1,2-Tetrachloroethane was not quantified. A subsequent report was issued on March 25, 2015, which included the quantification of 1,1,1,2-Tetrachloroethane.

Holding Times and Sample Preservation

Samples were analyzed within the method-specific holding time. No sample preservation was required for this type of sampling.

Method Blanks

No target compounds were detected in the method blank for the APH analyses. For TO-15, two compounds were detected in the method blank at estimated concentrations below the method detection limits. Naphthalene was detected at 0.015 ug/m^3 (detection limit of 0.063 ug/m^3) and 1,2,4-Trichlorobenzene was detected at 0.0011 ug/m^3 (detection limit of 0.074 ug/m^3).

LCS Results

An LCS and LCS Duplicate were analyzed with the samples for both TO-15 and APH analyses. All LCS recoveries and RPDs were acceptable for both TO-15 and APH analyses.

Field Duplicate Results

Samples L1504425-04 and L1504425-05 were submitted as the field duplicate pair for this sample set and both represented location S-157-J. The field and duplicate sample were collected using two canisters located next to each other. The following table summarizes the RPDs of the detected compounds.

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Compound	L1504425-04 (µg/m^3)	L1504425-05 (µg/m^3)	RPD (%)
1,2,4-Trimethylbenzene	15.1	17.0	11.8
1,2-Dichloroethane	0.077J	0.077J	0.0
1,3,5-Trimethylbenzene	4.04	4.46	9.9
1,3 - Butadiene	0.058	0.066	12.9
2-Butanone	1.57	1.18J	28.4
4-Ethyltoluene	3.66	3.95	7.6
Acetone	33.0	31.4	5.0
Benzene	0.827	0.767	7.5
Carbon Tetrachloride	0.434	0.409	5.9
Chloroethane	<0.019	0.032J	N/A
Chloroform	0.117	0.122	4.2
Chloromethane	1.10	1.13	2.7
Cis -1,2-dichloroethene	0.107	0.131	20.2
Cyclohexane	25.0	0.334J	194.7
Dichlorodifluoromethane	1.75	1.98	12.3
Ethanol	102	84.4	18.9
Ethylbenzene	0.495	0.482	2.7
Freon-113	0.621	0.583	6.3
Freon-114	0.098J	0.105J	6.9
Hexane	0.856	0.314	92.6
Isopropyl Alcohol	78.4	91.7	15.6
Methylene Chloride	16.2	2.72	142.5
m/p- Xylenes	1.53	1.45	5.4
n-Heptane	0.459J	0.402J	13.2
Naphthalene	0.173J	0.189J	8.8
o-Xylene	0.786	0.808	2.8
Propylene	0.503J	0.520J	3.3
Styrene	0.170	0.149	13.2
Tetrachloroethene	0.190	0.170	11.1
Toluene	3.18	3.13	1.6
Trichlorofluoromethane	1.20	1.25	4.1
C_5-C_8 Aliphatics	38	<12	N/A
C_9-C_{12} Aliphatics	130	140	7.4
C_9-C_{10} Aromatics	45	51	12.5

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It should be noted that acceptable RPDs for field duplicates are less than 40% for compounds whose detected values are greater than five times the estimated quantitation limit (EQL); and for compounds whose detected values are less than five times the EQL, value differences between the field sample and its associated duplicate are to be less than 2.5 times the EQL. Based on these criteria, the RPDs for the compounds listed above are acceptable except for Cyclohexane, Hexane, and Methylene Chloride.

Field Blank Results

Field blanks were performed or both the indoor air and soil gas analyses. No target compounds were detected in the field blanks for the APH analyses and no compounds were detected in the indoor air field blank for TO-15 analysis. For the soil gas blank for TO-15 analysis, four compounds (acetone, ethanol, 2-butanone, and m/p-xylene) were detected in the field blank at estimated concentrations below the method detection limits. Also, 1,2,4-trimethylbenzene was detected at a concentration of 0.172 ug/m^3. None of these detections are viewed as significant as each of these five compounds were detected in the soil gas samples at concentrations greater by at least an order of magnitude then the levels found in the field blank.

Quantitation Limits and Sample Results

Reported quantitation limits include both reporting limits and method detection limits (the method detection limits are lower than the reporting limits). In previous sampling efforts, only reporting limits were included in the laboratory analysis reports. In addition to including the analytical method detection limits, detected compounds at concentrations greater than the method detection limits and less than the reporting limits were noted as estimated concentration (J-qualified).

Sample SG-4 (L1504425-10) analysis result for acetone should be considered to be estimated due to co-elution with a non-target peak and is noted in the analytical summary table (**Table 1**) with an "E" qualifier. The results for isopropyl alcohol for samples SG-1 through SG-3 (L1504425-07 through -09) and Laboratory Duplicate WG767577-5 could not be determined due to a non-target compound interfering with the identification and quantification of that compound.

In all field samples except Outdoor Control (L1504425-01) and the field blanks (L1504425-06 and L1504425-10), unknown siloxanes were present in the C_5-C_8 Aliphatics and C_9-C_{12} Aliphatics ranges of the APH analysis. Their response was not included in the calculation of the results of the ranges as siloxanes are not petroleum compounds.

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Air Canister Certification Results

Air canister certifications were performed using batch canister certifications for analyses of TO-15, TO-15 SIM, and APH. All certifications were acceptable as no compounds were detected and all internal standard recoveries were acceptable.

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